DRAFT

WP2020 – Scientific support

Comparison of ESA / USGS
Landsat ETM+
Fast Format products

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DOCUMENT STATUS SHEET

Issue	Date	Comments	Author
0.1	23/07/2001	Creation of this document	S. Riazanoff
0.2	24/07/2001	Histogram comparison	S. Riazanoff
0.3	24/07/2001	Review meeting 24/07/2001 – integration of changes	S. Riazanoff
0.4	31/07/2001	Figure 2.6.d – Corrected “ESA” to “USGS”	C. Demange
0.5	06/09/2003	Appended “Appendix C – Assessment of USGS engineers”	S. Riazanoff

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1 INTRODUCTION

1.1 Rationale

This report is part of WP2020 (Scientific Support) in the framework of contract n°15015/01/I-LG ("Maintenance and Evolution of the Multi-mission Quality Control System").

Request of the Agency registered the 13/07/2001 is to analyze all the differences between the Landsat ETM+ Fast Format produced by ESA with regard to those produced by the USGS.

To perform such analysis the following six products (ESA and USGS products for each one of the three sites) have been provided by the Agency.

path-row	Acquisition date	Country
176-39	19/03/2001	Egypt
179-33	09/04/2001	Turkey
193-36	11/04/2001	Algeria / Tunisia

No one of the products listed here above falls within an area for that GAEL Consultant owns cartographic elements (maps, geodetic points, GPS points…).

For this reason, this report cannot consider the absolute location accuracy assessment and as been limited to the first scene 176-39.

1.2 Applicable documents

This section lists the document that is applied within the framework of the current report.

A-1 Contract N°15015/01/I-LG — *Maintenance and evolution of the Multi Mission Quality Control System*
April 4, 2001
ESRIN - GAEL Consultant

1.3 Reference documents

This section describes the related documents and applied conventions to be considered within this document.

R-1 510-3DFC/0197 — *Earth Science Data and Information System (ESDIS), Level 1 Product Output Files, Data Format Control Block, Volume 5, Book 2*
Release 3 – July 1999
Goddard Space Flight Center - NASA

R-2 - *Landsat 7 Map Projection Parameters*
- *Landsat 7 Map Projection Parameters*
http://ltpwww.gsfc.nasa.gov/IAS/handbook/handbook_htmls/chapter11/htmls/proj_parms.html

R-3 - *USGS MIPS Map Projection Parameters*
http://terraweb.wr.usgs.gov/software/mips/link/maplib.html

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1.4 Abbreviations and acronyms

This section controls the definition of all abbreviations and acronyms used within this document. A special attention has been paid to inherit abbreviations, acronyms and their definitions from international standards as ISO, ANSI, and ECSS.

ANSI	American national standards institute
API	Application programming interface
CEOS	Committee on earth observation satellites
ECSS	European cooperation for space standardization
ESA	European Space Agency
ETM+	Enhanced Thematic Mapper
GCP	Ground Control Point
GIS	Geographic Information System
GPS	Global Positioning System
GRP	Ground Reference Point
ISO	International organization for standardization
MMQCS	Multi mission quality control system (QUISS)
RMS	Root Mean Square
USGS	United States Geographical Survey
VNIR-SWIR	Visible Near Infra-Red – Short Wave Infra-Red

1.5 Notations

Comments are underlined by the gray background and are numbered sequentially within a second level sub-section (example C1, C2 in section 2.1).

Within this document the notation [R – #] is used to identify a reference document.

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2 SCENE 176-39 ACQUIRED ON 19/03/2001

2.1 Analysis of CD-ROM contents

Table here below simply lists the contents of CD-ROM containing the input data.

ESA		USGS	
51577456	L71176039_03920010319_B10.FST	58911381	L71176039_03920010319_B10.FST
51577456	L71176039_03920010319_B20.FST	58911381	L71176039_03920010319_B20.FST
51577456	L71176039_03920010319_B30.FST	58911381	L71176039_03920010319_B30.FST
51577456	L71176039_03920010319_B40.FST	58911381	L71176039_03920010319_B40.FST
51577456	L71176039_03920010319_B50.FST	58911381	L71176039_03920010319_B50.FST
51577456	L71176039_03920010319_B61.FST	14731691	L71176039_03920010319_B61.FST
4608	L71176039_03920010319_HPN.FST	4608	L71176039_03920010319_HPN.FST
4608	L71176039_03920010319_HRF.FST	4608	L71176039_03920010319_HRF.FST
4608	L71176039_03920010319_HTM.FST	4608	L71176039_03920010319_HTM.FST
51577456	L72176039_03920010319_B62.FST	14731691	L72176039_03920010319_B62.FST
51577456	L72176039_03920010319_B70.FST	58911381	L72176039_03920010319_B70.FST
206309824	L72176039_03920010319_B80.FST	235614761	L72176039_03920010319_B80.FST
2443	README.FF7	5320	README.FF7
		65535	L71176039_03920010319_MTL.FST
total 605140 bytes		total 604828 bytes	

C1. Metadata file

Metadata file "L71176039_03920010319_MTL.FST" is present in USGS and not in ESA distribution.

C2. README.FF7

README.FF7 file contains more information in USGS distribution.

C3. USGS data files bigger

Except for thermal data (see comment C4) USGS data files are almost always bigger than the ESA relative ones.

C4. Resolution of thermal bands

Thermal channels "B61" and "B62" of USGS have the nominal 60 meters resolution while these two channels have been resampled at 30 meters in ESA distribution.

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2.2 ESA product import and format errors

When importing ESA data (command “`IMPORT -if cdrom > log.IMPORT`”), the following errors have been observed producing warnings and errors that are recorded here after.

C1. Fraction and subscene locations

At the opposite of USGS that is compliant with [R-1], location information found in ESA Administrative Header Files (“HPN”, “HRF” and “HTM”) contains undefined symbols (“F” for Full or Floating?):

```
ESA:  ...LOC =176/039F          ...
USGS: ...LOC =176/0390000       ...
```

```
TimSScanF : Cannot decode field [41-42], position=0,  contents="F "   (46 20 )
TimFmtTmL7aFastHeaderRead : Warning : Unable to extract location fraction.
TimSScanF : Cannot decode field [43-44], position=0,  contents="  "   (20 20 )
TimFmtTmL7aFastHeaderRead : Warning : Unable to extract location subscene.
TimSScanF : Cannot decode field [41-42], position=0,  contents="F "   (46 20 )
TimFmtTmL7aFastHeaderRead : Warning : Unable to extract location fraction.
TimSScanF : Cannot decode field [43-44], position=0,  contents="  "   (20 20 )
TimFmtTmL7aFastHeaderRead : Warning : Unable to extract location subscene.
TimSScanF : Cannot decode field [41-42], position=0,  contents="F "   (46 20 )
TimFmtTmL7aFastHeaderRead : Warning : Unable to extract location fraction.
TimSScanF : Cannot decode field [43-44], position=0,  contents="  "   (20 20 )
TimFmtTmL7aFastHeaderRead : Warning : Unable to extract location subscene.
```

C2. Record size

Both in ESA and USGS distributions, record size (as defined in [R-1]) is confused with file size:

```
ESA:  ...REC SIZE  =51577456  ...
USGS: ...REC SIZE  =58911381  ...:
```

```
TimFmtTmL7aFastHeaderRead : Warning : Invalid record size.
TimFmtTmL7aFastHeaderRead : Warning : Invalid record size.
TimFmtTmL7aFastHeaderRead : Warning : Invalid record size.
```

C3. UTM projection parameters

According to [R-1] (but not to [R-2] that is less official), the two first USGS coefficients in table shall match the "longitude and latitude of any point within the UTM zone or shall be equal to zero" when the "UTM" projection is selected. Meanwhile, the two values within the table of ESA product match the semi-major and semi-minor axis of "GRS 1980".

ESA

```
GEOMETRIC DATA MAP PROJECTION =UTM  ELLIPSOID =WGS84              DATUM =WGS84
USGS PROJECTION PARAMETERS = 0.637813700000000D+07    0.635675231400000D+07
0.000000000000000D+00    0.000000000000000D+00    0.000000000000000D+00
0.000000000000000D+00    0.000000000000000D+00    0.000000000000000D+00
0.000000000000000D+00    0.000000000000000D+00    0.000000000000000D+00
0.000000000000000D+00    0.000000000000000D+00    0.000000000000000D+00
0.000000000000000D+00    USGS MAP ZONE =36
```

USGS

```
GEOMETRIC DATA MAP PROJECTION =UTM  ELLIPSOID =WGS84              DATUM =WGS84
USGS PROJECTION PARAMETERS = 0.000000000000000D+00    0.000000000000000D+00
0.000000000000000D+00    0.000000000000000D+00    0.000000000000000D+00
0.000000000000000D+00    0.000000000000000D+00    0.000000000000000D+00
0.000000000000000D+00    0.000000000000000D+00    0.000000000000000D+00
0.000000000000000D+00    0.000000000000000D+00    0.000000000000000D+00
0.000000000000000D+00    USGS MAP ZONE =36
```

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C4. Ellipsoid information

The ellipsoid defined in USGS parameters of ESA product is "GRS 1980" (see comment C3) and not "WGS 1984" as found after the "ELLIPSOID" key word.

```
TimPrjUsgsToTim : Warning : Provided ellipsoid name "WGS84" does not match the semi-
major and semi-minor axis values (6378137.000000,6356752.314000) found within the USGS
coefficients table. These last values match the "GRS_1980" ellipsoid that has been
retained.
```

C5. Orientation angle

"ORIENTATION ANGLE" for "MAP ORIENTED" products shall be 0.0. The non-null value encountered in ESA product looks like the one used in "PATH ORIENTED" products.

```
ESA:
OFFSET =0      ORIENTATION ANGLE =-10.03
SUN ELEVATION ANGLE =50.2 SUN AZIMUTH ANGLE =135.8
USGS:
OFFSET =122    ORIENTATION ANGLE =0.00
SUN ELEVATION ANGLE =50.2 SUN AZIMUTH ANGLE =135.8
```

```
TimFmtTmL7aFastHeaderRead : Warning : Orientation found (-10.030000) and computed
(0.000000) are too different. Using default "0.000000" degrees.
```

2.3 USGS product import and format errors

When importing USGS data (command "`IMPORT -if cdrom > log.IMPORT`), the following errors have been observed producing warnings and errors that are recorded here after.

C1. Record size

Both in ESA and USGS distributions, record size (as defined in [R-1]) is confused with full file size:

```
ESA:  ...REC SIZE  =51577456  ...
USGS: ...REC SIZE  =58911381  ...:
```

```
TimFmtTmL7aFastHeaderRead : Warning : Invalid record size.
TimFmtTmL7aFastHeaderRead : Warning : Invalid record size.
TimFmtTmL7aFastHeaderRead : Warning : Invalid record size.
```

2.4 ESA header files – Checking coordinates

Checking from header file

The following coordinate values have been found in the ESA headers:

```
VNIR-SWIR     ==> L71176039_03920010319_HRF.FST <==
UL = 0304449.7758E 311423.1889N    285444.500   3458363.750   (reference)
UR = 0330359.5294E 311534.2086N    506334.500   3458363.750
LR = 0330354.9563E 292149.0072N    506334.500   3248273.750   (reference)
LL = 0304724.2504E 292043.1579N    285444.500   3248273.750
CENTER = 0315507.0907E 301825.3413N    396024.469   3353303.750 3682  3502
VOLUME #/# IN SET =01/01 PIXELS PER LINE =7364  LINES PER BAND =7004 /7004

THERMAL       ==> L71176039_03920010319_HTM.FST <==
UL = 0304449.1990E 311423.6627N    285429.500   3458378.750   (-15,+15)
UR = 0330358.9526E 311534.6961N    506319.500   3458378.750
LR = 0330354.3933E 292149.4947N    506319.500   3248288.750   (-15,+15)
LL = 0304723.6874E 292043.6386N    285429.500   3248288.750
CENTER = 0315507.0907E 301825.3413N    396024.469   3353303.750 3682  3502
VOLUME #/# IN SET =01/01 PIXELS PER LINE =7364  LINES PER BAND =7004 /7004
```

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```
PANCHROMATIC ==> L71176039_03920010319_HPN.FST <==
UL = 0304449.7758E 311423.1889N    285444.500   3458363.750   ( 0, 0)
UR = 0330400.0924E 311534.2086N    506349.500   3458363.750
LR = 0330355.5056E 292148.5197N    506349.500   3248258.750   (+15,+15)
LL = 0304724.2642E 292042.6704N    285444.500   3248258.750
CENTER = 0315507.0907E 301825.3413N    396024.469   3353303.750 7364  7004
VOLUME #/# IN SET =01/01 PIXELS PER LINE =14728 LINES PER BAND =14008/14008
```

C1. Different UL LR

The three band groups (VNIR/SWIR, THERMAL and PANCHROMATIC) have been cut in order to be superimposable and nevertheless they do not have exactly the same upper-left (UL) and lower-right (LR) coordinates.

Taking VNIR/SWIR as the reference, THERMAL is uniformly shifted half a 30m-pixel in both directions. An adjustment in the resampling technique could have guaranty a (0,0) superimposition.

PANCHROMATIC UL is invariant while its expected value should be (-15,+15) and LR is shifted (+15,+15) while its expected value should be (+15,-15) taking into account its 15 meters resolution.

C2. Location of scene center

Cartographic coordinates of any point within a geocoded image are simply computed adding to the upper-left corner coordinates the number of pixels (or lines) multiplied by the pixel width (respectively height). Applying such rule to the center coordinates leads to an important easting error (see example of PANCHROMATIC scene center here above).

Values found within the PANCHROMATIC header:

```
UL: p=0             (pixel)                    UR: p=14727
    q=0             (line)                         q=0
    X= 285444.500   (easting)                      X= 506349.500
    Y=3458363.750   (northing)                     Y=3458363.750
                         CENTER: p=7364
                                 q=7004
                                 X= 396024.469
                                 Y=3353303.750
LL: p=0                                        LR: p=14727
    q=14007                                        q=14007
    X= 285444.500                                  X= 506349.500
    Y=3248258.750                                  Y=3248258.750
```

LR and scene center values computed just applying the geocoded image rule:

```
LR    : X= 506349.500  =  285444.500 + 14727 * 15                          OK!
        Y=3248258.750  = 3458363.750 - 14007 * 15                          OK!

CENTER: X= 396024.469  ¹  285444.500 + 7364 * 15 = 395904.5 -> DX=-119.969   Error
        Y=3353303.750  = 3458363.750 - 7004 * 15                           OK!
```

Checking from GEOREF application

Within the images here below, GEOREF application has been used to control the compliance of the four corners and center coordinates with regard to the coordinates simply deduced from their location in the geocoded image. Error vector field has been magnified by x500 factor.

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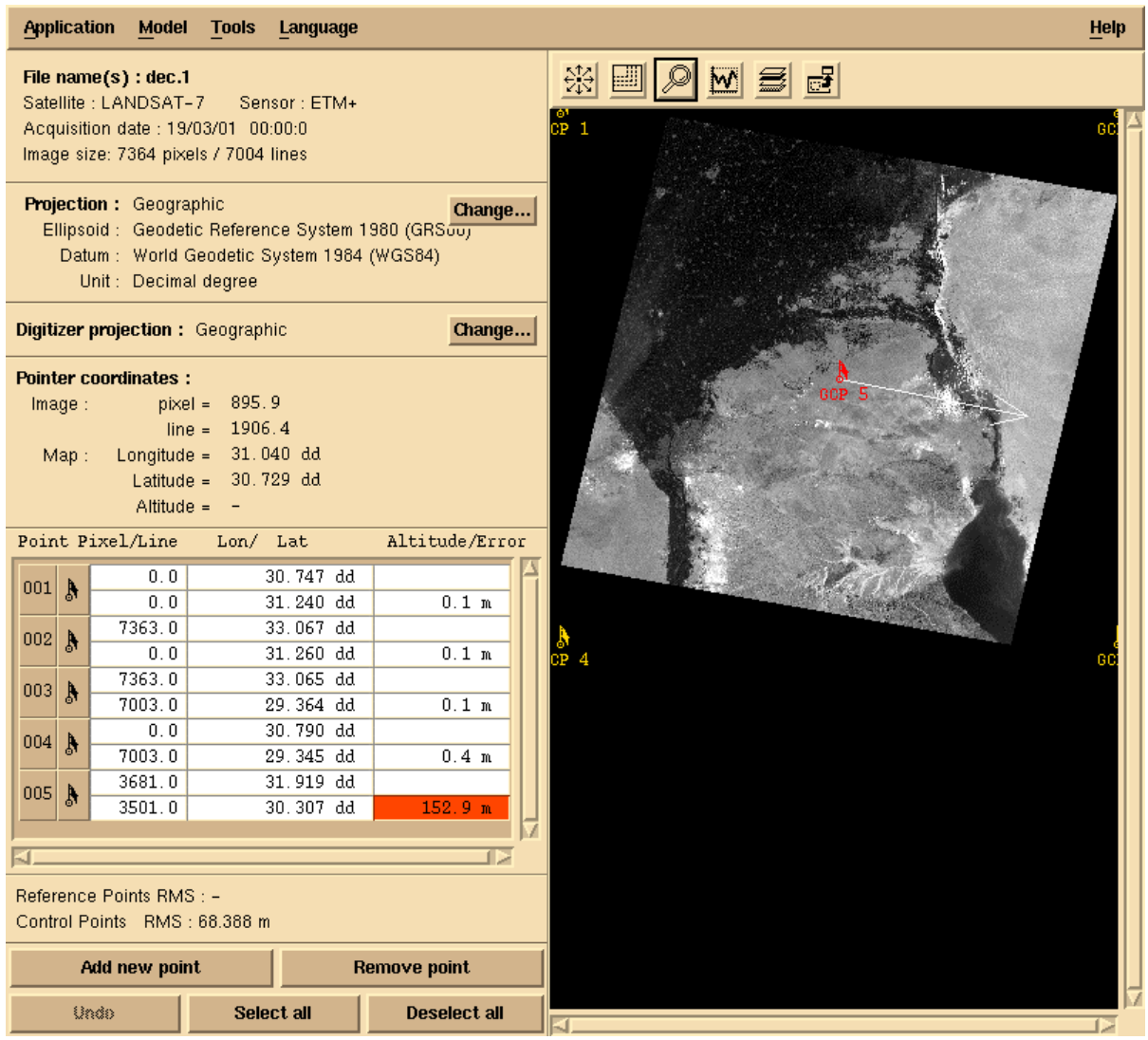

Figure 2.4.a – Control of the ESA GCPs – VNIR-SWIR

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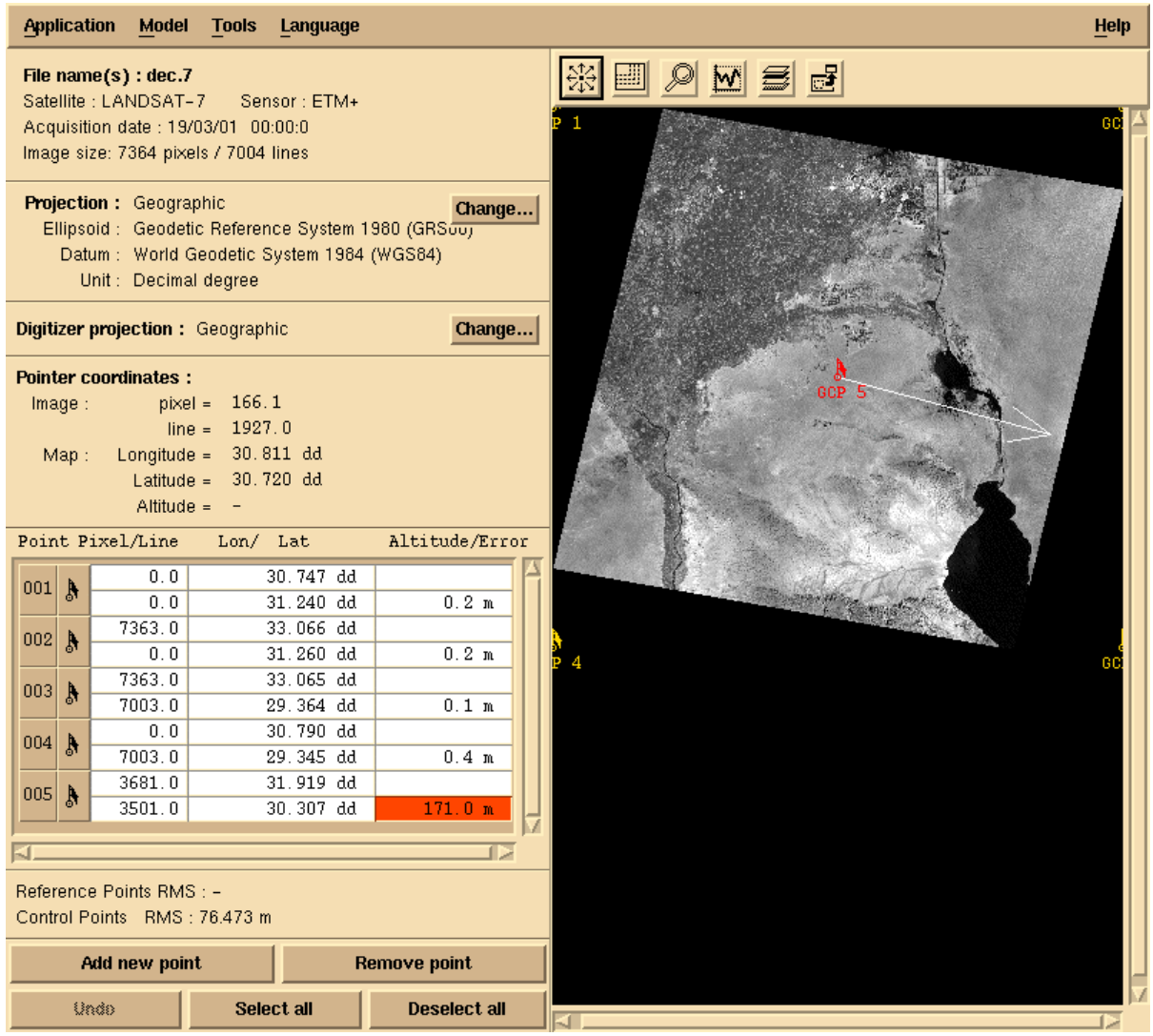

Figure 2.4.b – Control of the ESA GCPs – THERMAL

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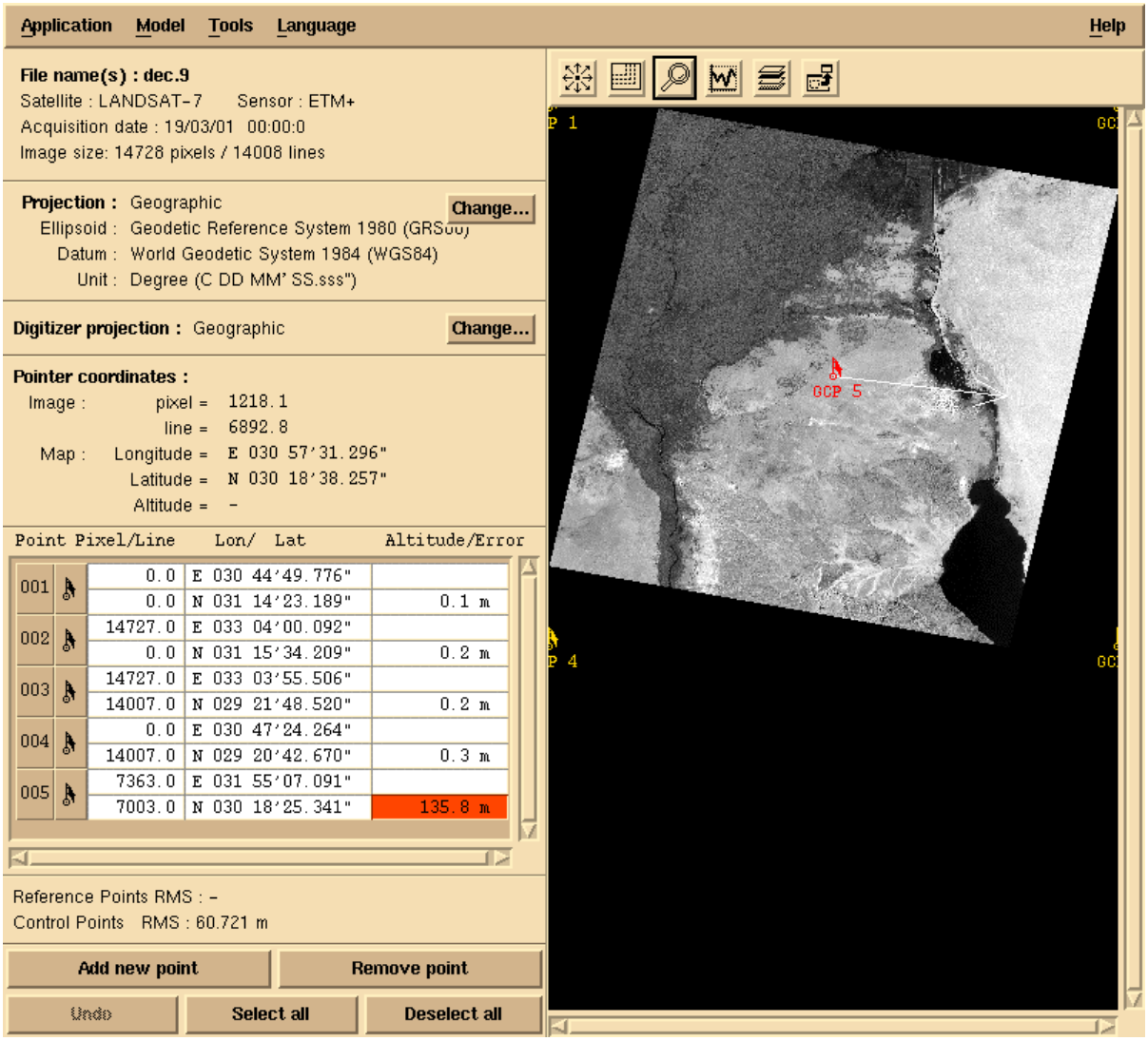

Figure 2.4.c – Control of the ESA GCPs – PANCHROMATIC

C3. Coordinates of scene center

As shown in the figures here above, the coordinates of the four corners are correct while the coordinates of the scene center is always erroneous. Error vector field is eastward approximately parallel to the line of the original scene (before geocoding).

Band group	VNIR-SWIR	THERMAL	PANCHROMATIC
Central point error	**152.9 m**	**171.0 m**	**135.8 m**

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2.5 USGS header files – Checking coordinates

Checking from header file

The following coordinate values have been found in the USGS headers:

```
PANCHROMATIC ==> L71176039_03920010319_HPN.FST <==
UL = 0303913.2473E 311555.7520N 276600.000    3461400.000
UR = 0331352.1132E 311712.1444N 522000.000    3461400.000
LR = 0331335.8053E 292015.0006N 522000.000    3245400.000
LL = 0304158.6095E 291904.3184N 276600.000    3245400.000
CENTER = 0315423.6518E 301823.1230N 394863.531    3353246.500   8181  7201
VOLUME #/# IN SET =01/01 PIXELS PER LINE =16361 LINES PER BAND =14401/14401

VNIR-SWIR     ==> L71176039_03920010319_HRF.FST <==
UL = 0303913.2473E 311555.7520N 276600.000    3461400.000
UR = 0331352.1132E 311712.1444N 522000.000    3461400.000
LR = 0331335.8053E 292015.0006N 522000.000    3245400.000
LL = 0304158.6095E 291904.3184N 276600.000    3245400.000
CENTER = 0315423.6518E 301823.1230N 394863.531    3353246.500   4091  3601
VOLUME #/# IN SET =01/01 PIXELS PER LINE =8181  LINES PER BAND =7201 /7201

THERMAL       ==> L71176039_03920010319_HTM.FST <==
UL = 0303913.2473E 311555.7520N 276600.000    3461400.000
UR = 0331352.1132E 311712.1444N 522000.000    3461400.000
LR = 0331335.8053E 292015.0006N 522000.000    3245400.000
LL = 0304158.6095E 291904.3184N 276600.000    3245400.000
CENTER = 0315423.6518E 301823.1230N 394863.531    3353246.500   2046  1801
VOLUME #/# IN SET =01/01 PIXELS PER LINE =4091  LINES PER BAND =3601 /3601
```

C1. Same UL UR

Even if the bounds of the three band groups are not perfectly superimposable (see section 2.6), UL and LR coordinates within the three band groups are strictly equals. Considering that these coordinates match the center of a pixel (or the upper left origin of a pixel), this equality does not take into account the different resolutions (30, 60 and 15 meters) of the band groups.

C2. USGS images are larger

As shown in the table here above, USGS are bigger than the ESA ones.

Band group	VNIR-SWIR	THERMAL	PANCHROMATIC
USGS: Number of lines	7201	3601	14401
ESA: Number of lines	7004	7004	14008
Number of extra lines	**+197**	**+198**(*)	**+393**
USGS: Number of pixels	8181	4091	16361
ESA: Number of pixels	7364	7364	14728
Number of extra pixels	**+817**	**+818**(*)	**+1633**

(*) Doubling the size of the USGS scene in order to fix the difference of resolution.

C3. Location of scene center

As for ESA product, applying the geocoded rule to the center coordinates leads to an important easting error (see example of PANCHROMATIC scene center here above). This error is much larger than the one observed for ESA product.

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Values found within the PANCHROMATIC header:

```
UL: p=0             (pixel)                    UR: p=16360
    q=0             (line)                         q=0
    X= 276600.000   (easting)                      X= 522000.000
    Y=3461400.050   (northing)                     Y=3461400.000
                      CENTER: p=8181
                              q=7201
                              X= 394863.531
                              Y=3353246.500
LL: p=0                                        LR: p=16360
q=14400                                        q=14400
X= 276600.000                                  X= 522000.000
Y=3245400.000                                  Y=3245400.000
```

LR and scene center values computed just applying the geocoded image rule:

```
LR    : X= 522000.000  =  276600.000 + 16360 * 15                              OK!
        Y=3245400.000  = 3461400.000 - 14400 * 15                              OK!

CENTER: X= 394863.531  ¹  276600.000 + 8181 * 15 = 399315.0 -> DX=+4451.469  Error
        Y=3353246.500  = 3461400.000 - 7201 * 15 =3353385.0 -> DY=-138.5      PB!
```

Checking from GEOREF application

As the ESA product in the previous section 2.4, GEOREF application has been used to control the compliance of the four corners and center coordinates with regard to the coordinates simply deduced from their location in the geocoded image. Error vector field has been magnified by x50 factor (and not x500 as for ESA product).

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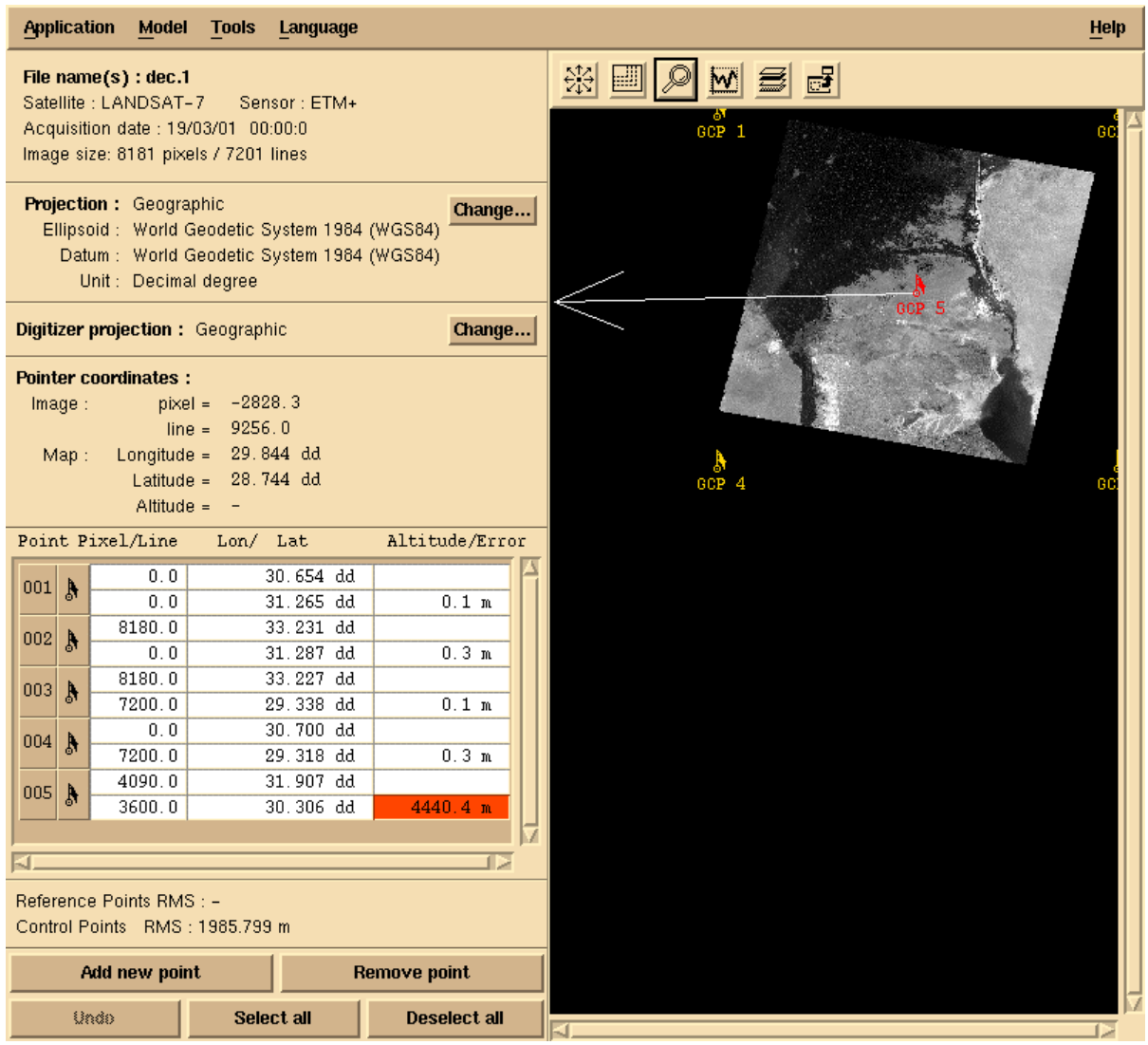

Figure 2.5.a – Control of the USGS GCPs – VNIR-SWIR

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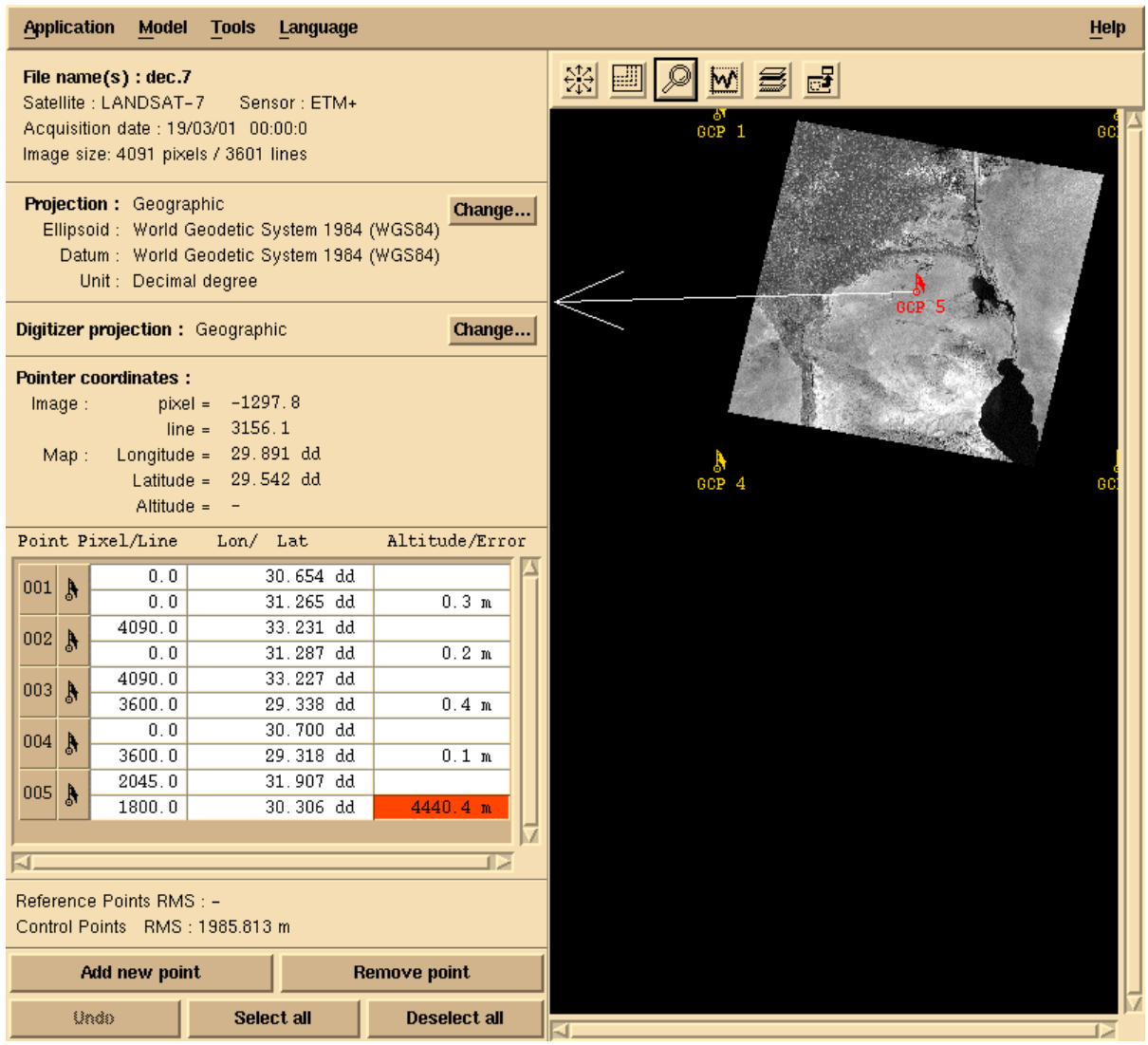

Figure 2.5.b – Control of the USGS GCPs – THERMAL

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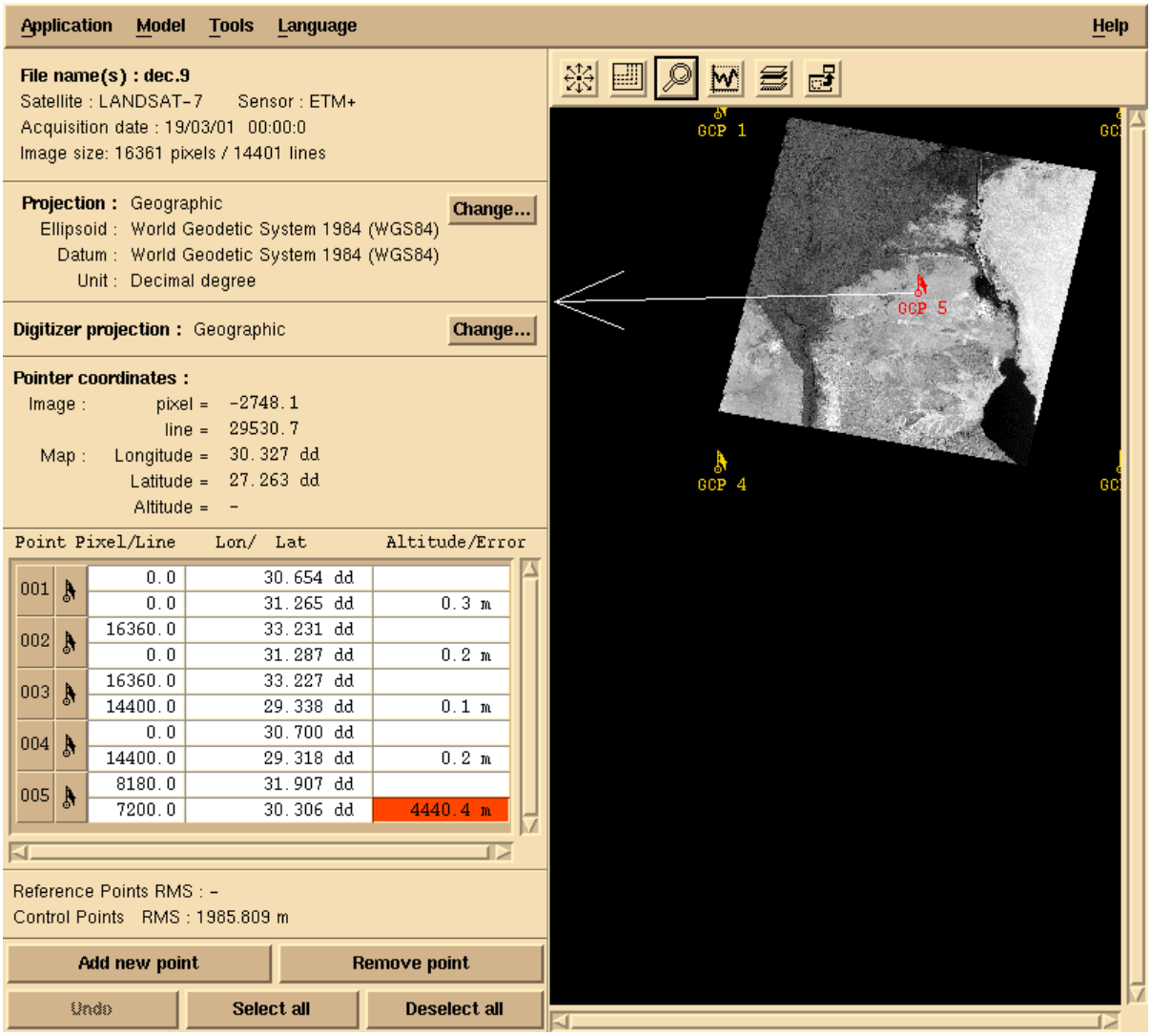

Figure 2.5.c – Control of the USGS GCPs – PANCHROMATIC

C3. Coordinates of scene center

In each one of the three band groups, coordinates are the same. All the four corners are correct while the scene center is severely erroneous (4440.4 meters). Error vector field is westward parallel to the line of the geocoded scene (horizontal).

Band group	VNIR-SWIR	THERMAL	PANCHROMATIC
Central point error	**4440.4 m**	**4440.4 m**	**4440.4 m**

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2.6 Size and location of ESA and USGS scenes

Rough estimation of absolute location in a GIS

In this section, we simulate the import of ESA and USGS scenes performed by an end-user within his GIS containing vectorial layers.

Command: `FRAME -if dec.9 /sarah_3/data/VECTOR/GMT/EUROPA_5_FULL/*.*`

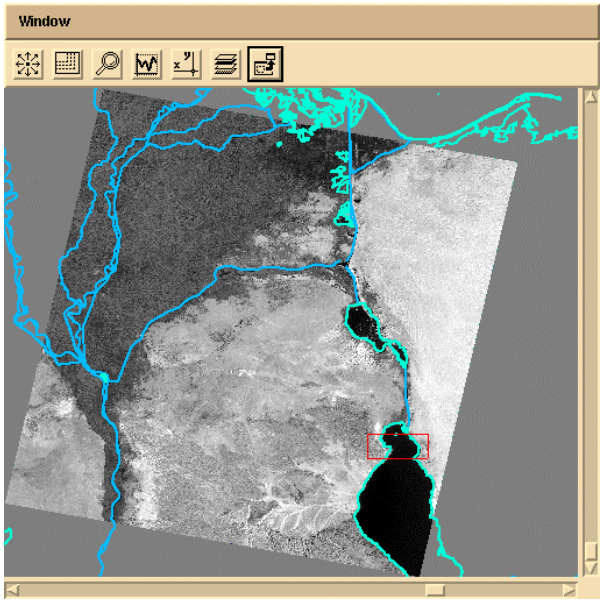

Figure 2.6.a – Full ESA scene

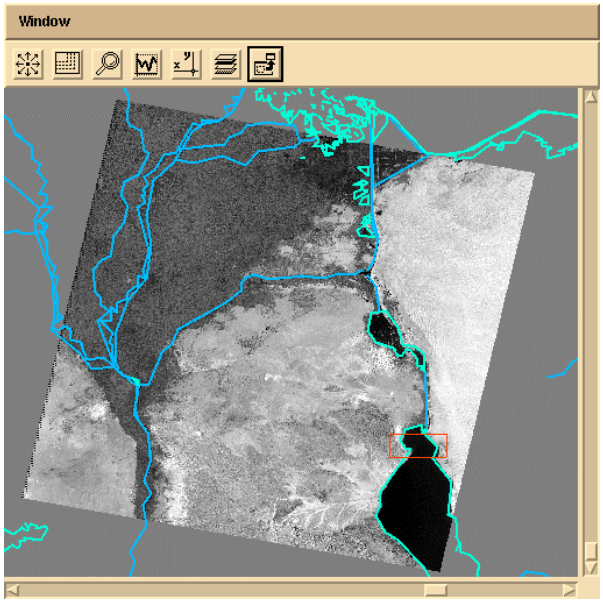

Figure 2.6.b – Full USGS scene

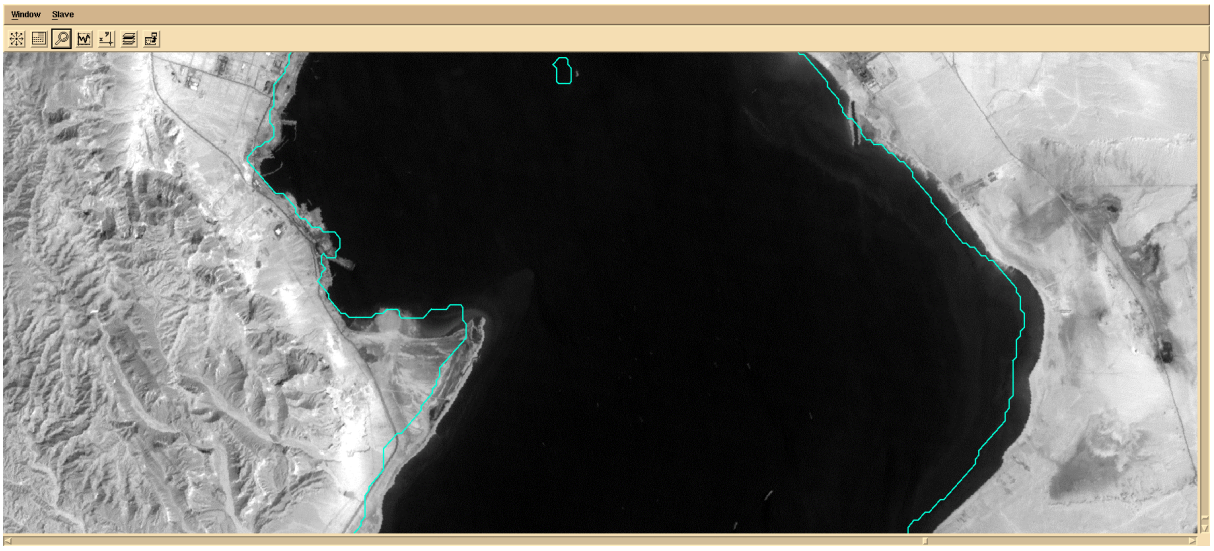

Figure 2.6.c –ESA scene in the window shown in 2.6.a – Scale 1:75000

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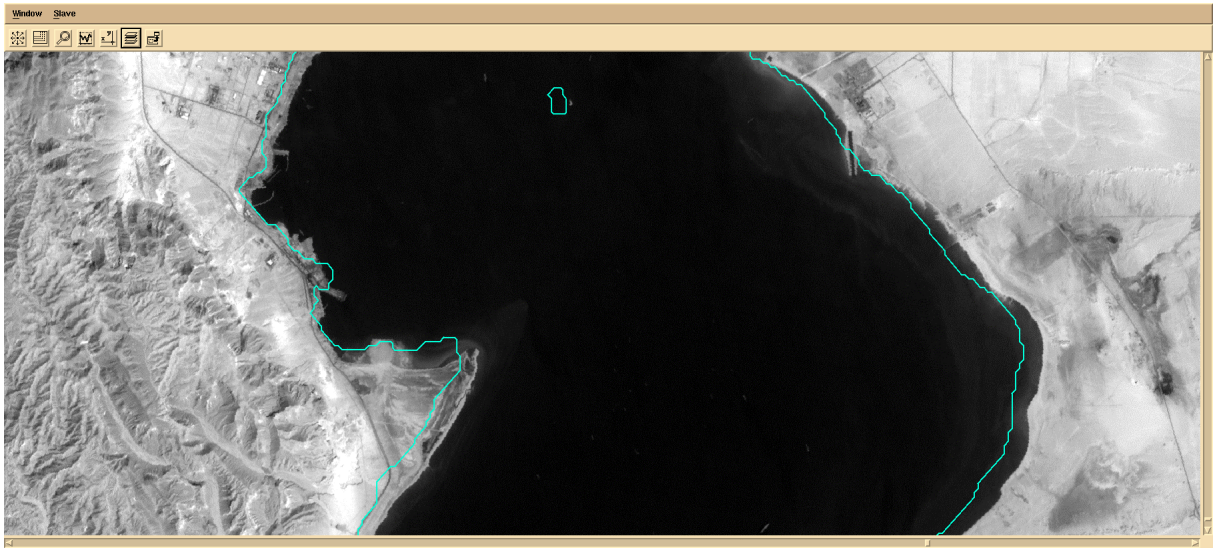

Figure 2.6.d –USGS scene in the window shown in 2.6.b – Scale 1:75000

C1. Quality of GMT vectorial layer

ESA or USGS scenes are geocoded and can be inserted in whatever GIS. In our example, GMT vectorial layers are superimposed on Landsat scenes. Absolute location of these GMT vectorial data has not been fully qualified. Nevertheless, in Europe, experience has shown that this absolute location is better than 100 meters.

C2. ESA and USGS scenes look the same

At small scale (full image) or larger scale (1:75000), location of ESA and USGS scenes look as being exactly the same. The algorithms used to produce both scenes should be the same.

C3. Rough absolute location

When displayed at 1:75000 scale, an approximate 500 meters shift is observed between the ESA (or USGS) scene and the vectorial layer.

Study of image boundaries

USGS images are larger than the ESA ones. Figure here below shows the image boundaries of ESA and USGS band groups.

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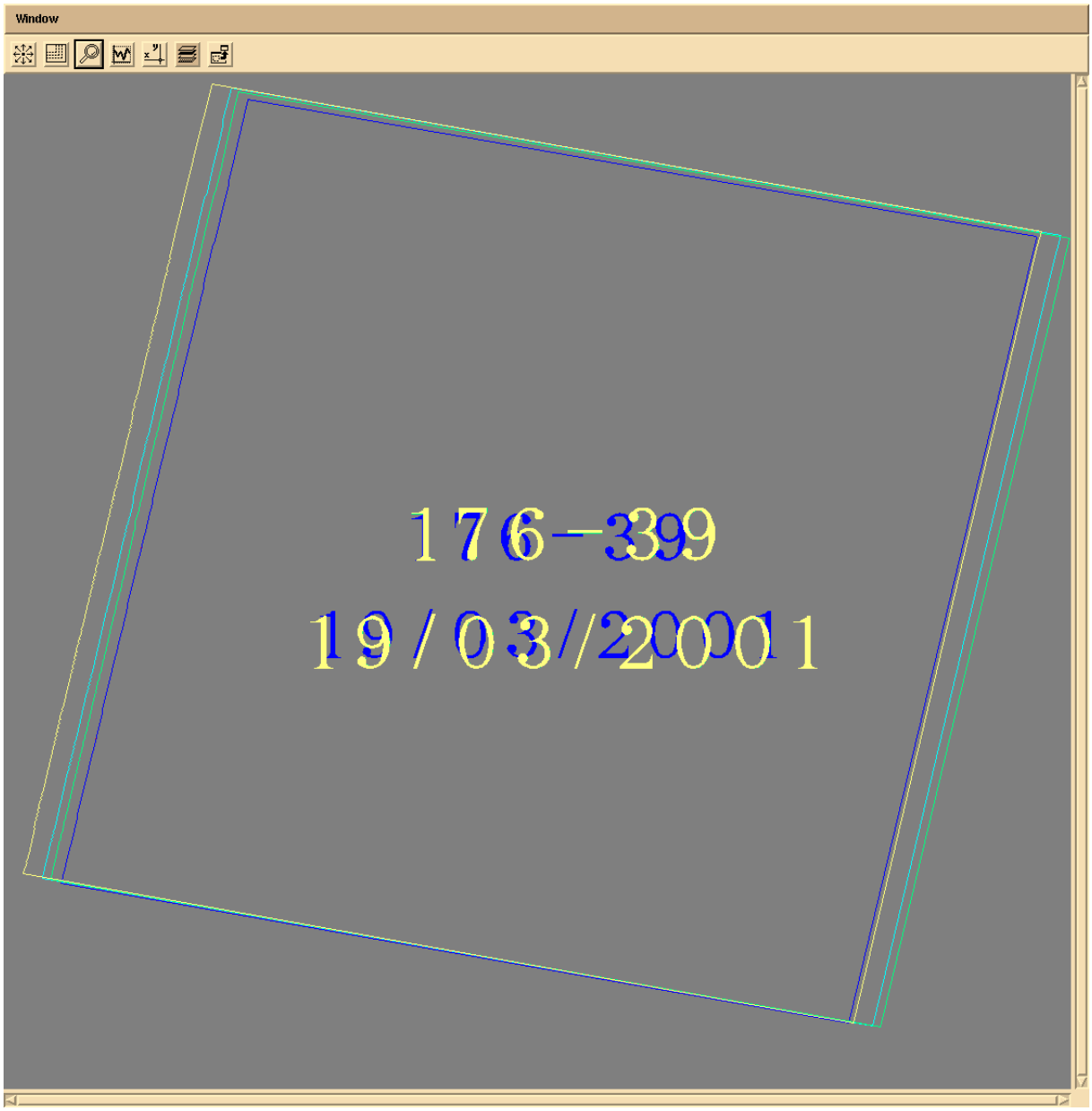

Figure 2.6.e – Boundaries of the band groups.

- blue ESA VNIR-SWIR, THERMAL and PANCHROMATIC,
- cyan USGS VNIR-SWIR,
- green USGS THERMAL,
- yellow USGS PANCHROMATIC.

C4. Border processing

In ESA images all the band groups have been cut to the same boundary that is the smallest quadrilateral. In USGS images, all the band groups have approximately the same geographic extents but are shifted. This shift matches the location of CCD detectors in the swath.

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Relative location of ESA scene versus USGS scene

ESA and USGS have not exactly the same projection: both are UTM 36 on datum WGS 1984 but the ellipsoid "GRS 1980" has been assumed (see the ambiguity relieved in section 2.2) for ESA scene while it is "WGS 1984" for the USGS scene.

As a consequence, raster images cannot be superimposed without geometric transformation on the same FRAME. USGS scene has therefore been mapped on the same cartographic system as the one used by ESA.

Command:
```
MAPPER -if dec.9  -of dec.9.GRS_1980 -fun "Image" -mod "Analytic"
-sam "Nearest neighbour" -prj \"projection=Utm ellipsoid=GRS_1980 datum=WGS_84
unit=meter horizontal_zone=36 vertical_zone="N" false_easting=500000
false_northing=0 \" -pxw 15 -pxh 15).
```

Superimposition of ESA and USGS scenes is simply assessed displaying them in the same window.

Command: `FRAME -if dec.9 ../176-39_20010319_USGS/dec.9.GRS_1980`

Images here below represent the four corners (UL,UR, LL and LR) of the PANCHROMATIC channel of both images displayed in "Full resolution" (scale 1:78688). ESA scene is always over the USGS one.

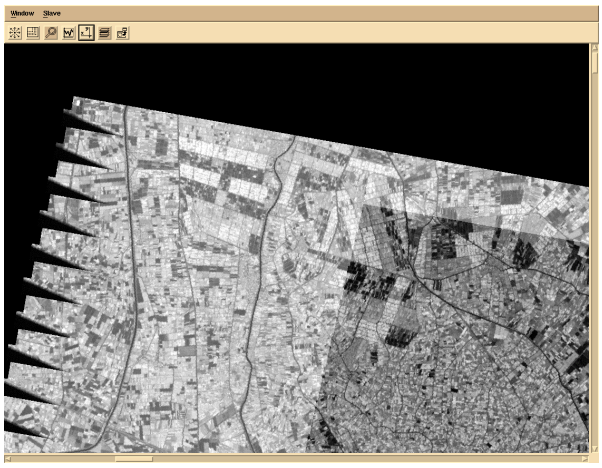

Figure 2.6.f – Full resolution in UL corner

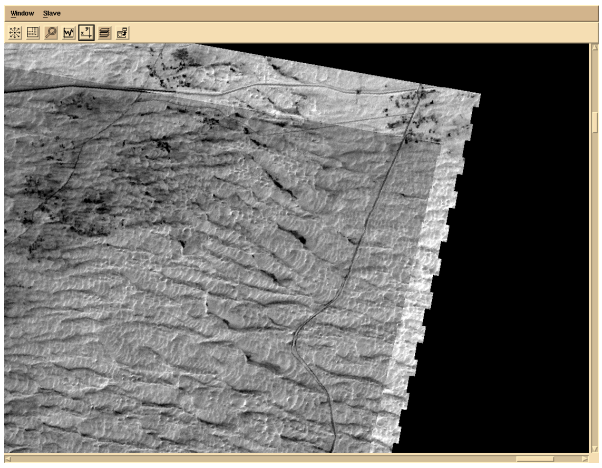

Figure 2.6.g – Full resolution in UR corner

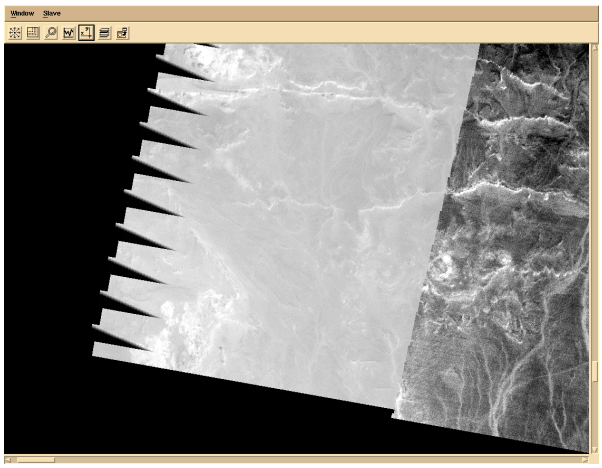

Figure 2.6.h – Full resolution in LL corner

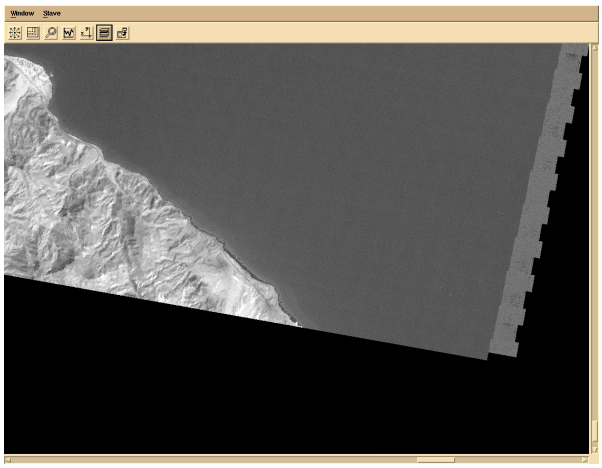

Figure 2.6.i – Full resolution in LR corner

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C5. Discontinuous cutting of borders in USGS scenes

At the opposite of ESA scenes, borders are not regularly cut. The swath boundaries are particularly visible together with the detector array displacements with a period of 2x16 detectors matching the forward and backward swaths. The triangular gaps on the left of panchromatic swaths are probably due to the scan line corrector (SLC) mirrors.

Such unsightly layout leads to difficulties for end user. It is difficult to remove these “fringes” setting an oblique quadrilateral to mask them.

This practice may be relevant to archive data keeping the most data as possible but has no sense when geocoded products are concerned for a direct use in end-user’s GIS.

C6. Good superimposition

We note the very good continuity of structures present in ESA scenes and those are prolonged in USGS scenes. Such conformity witnesses the good relative location between the ESA and USGS scenes.

C7. Along track location and WRS

The along track location of ESA and USGS scenes along the path is not strictly the same. USGS scene starts 109 PANCHROMATIC lines higher and last approximately 10 lines before the ESA scene. This 1640 m along track shift could denote that algorithms to determine limits in WRS (World Reference System) grid are not exactly the same.

2.7 Absolute location assessment from GMT vectorial layers

Despite the lack of guaranties regarding the quality of absolute location of GMT vectorial layers, an attempt of location accuracy assessment has been conducted using the georeferencing application (GEOREF). This application is used routinely to control the quality of cartographic products at GAEL Consultant.

Because of the observed superimposition of ESA and USGS scenes (see previous section), only the ESA scene has been controlled. In the image here below, error vector fields have been magnified by a x100 factor.

Command: `GEOREF -if dec.9 -ref /sarah_3/data/VECTOR/GMT/EUROPA_5_FULL/*.*`

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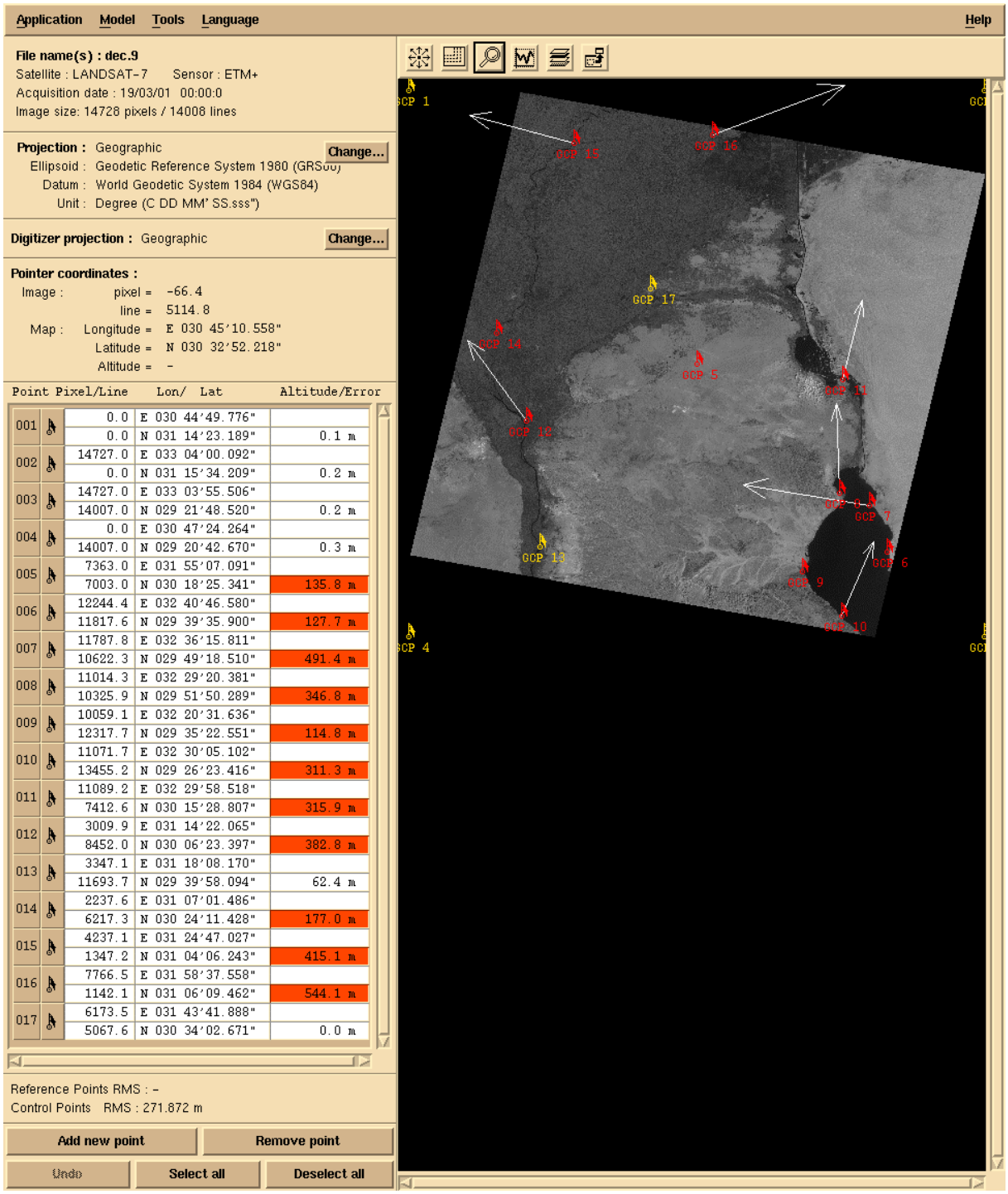

Figure 2.7 – Control of ESA scene from the GMT layers.

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C1. Quality control of ESA scene from GMT layer

Error vectors and values relieved in report do not show an uniform or systematic deformation and therefore do not look significant. In addition the number of reliable points (intersections, angles) found in vectorial layers is very low.

The observed 271.872 meters absolute location error is just an indicator that cannot be considered as absolutely reliable.

```
                  *** GEOREF - Report ***

Date                 : 20/07/2001
File name(s)         : dec.9
Observation date     : 19/03/2001 - 00:00:00.0
Input DEM(s) name(s) : -
Model                : Image
Projection           : Geographic
GCP RMS error        : 271.872
GCP mean error       : 201.536


GROUND CONTROL POINT(S) (GCP)

----+------------------+-------------------------------------------+-----------
 No | line     pixel   | Easting               Northing            | Altitude
----+------------------+-------------------------------------------+-----------
  1 |     0.0,     0.0 |     E 030 44'49.776",     N 031 14'23.189" |       -
  2 |     0.0, 14727.0 |     E 033 04'00.092",     N 031 15'34.209" |       -
  3 | 14007.0, 14727.0 |     E 033 03'55.506",     N 029 21'48.520" |       -
  4 | 14007.0,     0.0 |     E 030 47'24.264",     N 029 20'42.670" |       -
  5 |  7003.0,  7363.0 |     E 031 55'07.091",     N 030 18'25.341" |       -
  6 | 11817.6, 12244.4 |     E 032 40'46.580",     N 029 39'35.900" |       -
  7 | 10622.3, 11787.8 |     E 032 36'15.811",     N 029 49'18.510" |       -
  8 | 10325.9, 11014.3 |     E 032 29'20.381",     N 029 51'50.289" |       -
  9 | 12317.7, 10059.1 |     E 032 20'31.636",     N 029 35'22.551" |       -
 10 | 13455.2, 11071.7 |     E 032 30'05.102",     N 029 26'23.416" |       -
 11 |  7412.6, 11089.2 |     E 032 29'58.518",     N 030 15'28.807" |       -
 12 |  8452.0,  3009.9 |     E 031 14'22.065",     N 030 06'23.397" |       -
 13 | 11693.7,  3347.1 |     E 031 18'08.170",     N 029 39'58.094" |       -
 14 |  6217.3,  2237.6 |     E 031 07'01.486",     N 030 24'11.428" |       -
 15 |  1347.2,  4237.1 |     E 031 24'47.027",     N 031 04'06.243" |       -
 16 |  1142.1,  7766.5 |     E 031 58'37.558",     N 031 06'09.462" |       -
 17 |  5067.6,  6173.5 |     E 031 43'41.888",     N 030 34'02.671" |       -
----+------------------+-------------------------------------------+-----------

----+---+-----------+-----------+-----------+-----------------------------------
 No |   | Error     | Delta X   | Delta Y   | Altitude class
----+---+-----------+-----------+-----------+-----------------------------------
  1 |   |     0.1 m |     0.0 m |     0.1 m | Any altitude
  2 |   |     0.2 m |     0.1 m |    -0.1 m | Any altitude
  3 |   |     0.2 m |     0.2 m |     0.1 m | Any altitude
  4 |   |     0.3 m |     0.2 m |     0.3 m | Any altitude
  5 | * |   135.8 m |  -135.1 m |    13.7 m | Any altitude
  6 | * |   127.7 m |   116.9 m |   -51.3 m | Any altitude
  7 | * |   491.4 m |   485.6 m |   -75.2 m | Any altitude
  8 | * |   346.8 m |    13.3 m |  -346.6 m | Any altitude
  9 | * |   114.8 m |    41.6 m |   107.0 m | Any altitude
 10 | * |   311.3 m |  -123.4 m |  -285.8 m | Any altitude
 11 | * |   315.9 m |   -77.6 m |  -306.2 m | Any altitude
 12 | * |   382.8 m |   229.8 m |  -306.1 m | Any altitude
 13 |   |    62.4 m |   -48.7 m |   -39.1 m | Any altitude
 14 | * |   177.0 m |  -112.5 m |   136.7 m | Any altitude
 15 | * |   415.1 m |   402.0 m |  -103.5 m | Any altitude
 16 | * |   544.1 m |  -506.8 m |  -197.9 m | Any altitude
 17 |   |     0.0 m |     0.0 m |     0.0 m | Any altitude
----+---+-----------+-----------+-----------+-----------------------------------
* points out of limit
```

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Mean	X :	**16.804 m**
Mean	Y :	**-85.511 m**
Mean	:	201.536 m
Standard deviation	X :	213.163 m
Standard deviation	Y :	144.502 m
Standard deviation	:	182.476 m
RMS error	X :	213.824 m
RMS error	Y :	167.907 m
RMS error	:	**271.872 m**
Point inside limit	:	6 (35 %)

Table 2.7 – Report of control of ESA scene from the GMT layers.

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2.8 Radiometry analysis

Scope of this study is twofold:

1. Check the relative superimposition of ESA and USGS groups of channels.
2. Check the correlation of the radiometry channel per channel between ESA and USGS images.

REGIST process is used to find the best model (with a degree strictly less than 2) allowing to make fit the deformed USGS scene over the ESA scene considered as reference.

Channels VNIR-SWIR 1, 2 and 3

Command: `REGIST -if1 dec.{1,2,3} -if2 ../176-39_20010319_USGS/dec.{1,2,3} -> dec.reg123`

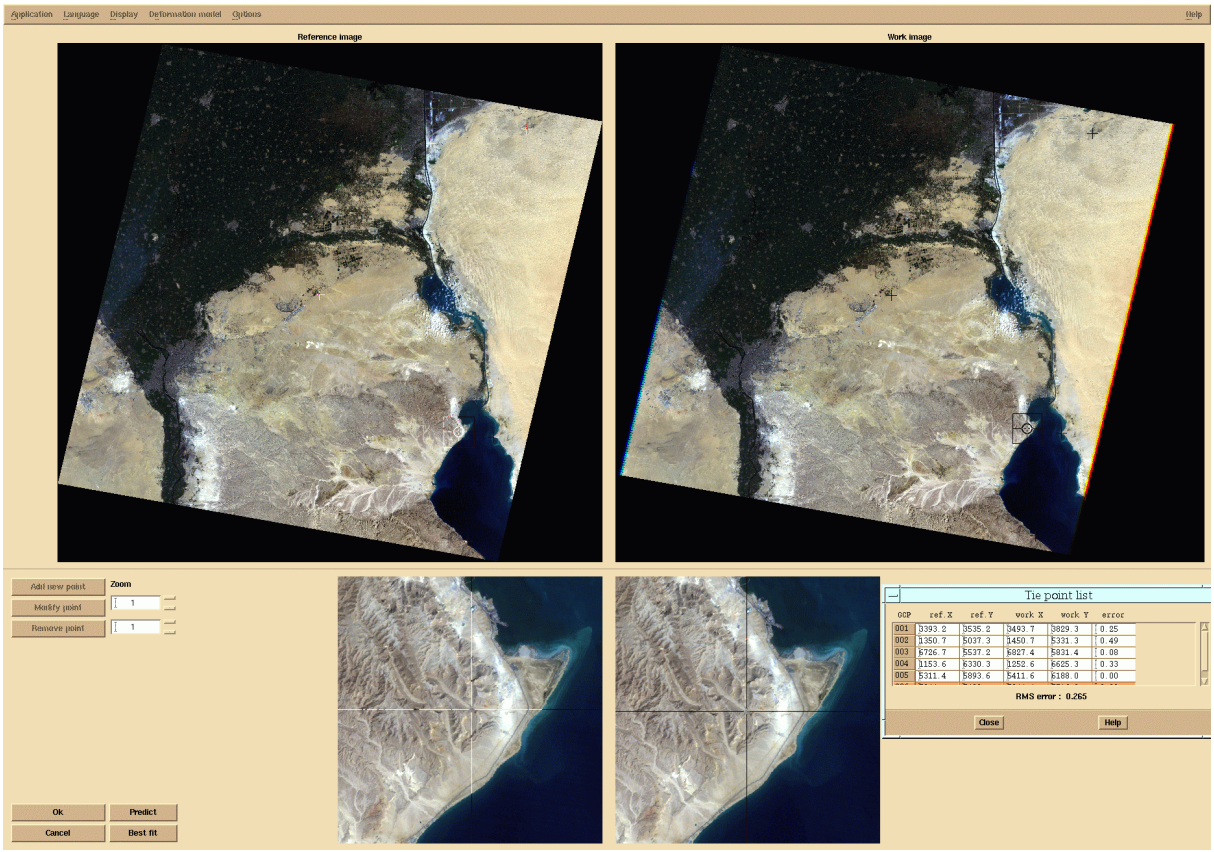

Figure 2.8.a – Registration of channels 1,2,3 from USGS scene (right) on ESA scene (left)

C1. Almost the same geometry

Five (5) tie-points have been entered. We may observe ("Flicker" function of REGIST) that ESA and USGS scenes have almost the same geometry (large majority of local deformations less than 1 pixel).

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This high similarity may be measured trying to transform the USGS image in the geometry of ESA image using a "Scaled rotation" model (composition of a rotation and an homotethy) registered on the 5 tie-points.

Results here below show that the proponed angle (0.000874 degrees) and the homotethy factor (0.999781) are very close the "Translation" function.

In the same way the RMS of the transform computed on these 5 points (0.447752 pixels ≅ 13 meters) shows that the internal geometry of both scenes are almost the same.

The large offset (-99.3518 lines and -293.06 pixels) is due to the larger border of USGS scene (see section 2.6).

Assessment of the model and residues using a “Scaled rotation” deformation model.

Command:
```
DEFORM -if ../176-39_20010319_USGS/dec.1 -ift dec.reg123 -of toto -fun "Scaled
       rotation"
SCALED ROTATION DEFORMATION MODEL

ANGLE  = -0.000874 degrees
FACTOR =     0.999781
DIRECT TRANSFORM
X(x,y) =     -99.3518  +      0.999781 * x  +   1.52501e-05 * y
Y(x,y) =      -293.06  +  -1.52501e-05 * x  +      0.999781 * y

INVERSE TRANSFORM
x(X,Y) =      99.3692  +       1.00022 * X  +  -1.52568e-05 * Y
y(X,Y) =      293.126  +   1.52568e-05 * X  +       1.00022 * Y


CONTROL POINT TRANSFORM - RMS ERROR
0     (3493.699951,3829.300049) -> (3393.640069,3535.347059)
Inv.   (3493.309805,3829.203024) <- (3393.250000,3535.250000)
1     (1450.699951,5331.299805) -> (1351.111207,5037.048433)
Inv.   (1450.288680,5331.551233) <- (1350.699951,5037.299805)
2     (6827.399902,5831.399902) -> (6726.639141,5536.956814)
Inv.   (6827.460855,5831.643328) <- (6726.700195,5537.200195)
3     (1252.599976,6625.299805) -> (1153.074428,6330.767552)
Inv.   (1253.125732,6624.831925) <- (1153.599976,6330.299805)
4     (5411.629883,6188.029785) -> (5311.185179,5893.530044)
Inv.   (5411.844591,6188.099836) <- (5311.399902,5893.600098)


Index  ErrorRank      Error              dX                dY
0        2         0.401963          0.390069          0.097059
1        3         0.481995          0.411256         -0.251371
2        1         0.250922         -0.061054         -0.243381
3        4         0.703554         -0.525548          0.467747
4        0         0.225862         -0.214723         -0.070054
RMS = 0.447852
```

Assessment of the model and residues using a “Translation” deformation model.

Command:
```
DEFORM -if ../176-39_20010319_USGS/dec.1 -ift dec.reg123 -of toto -fun
       "Translation"
TRANSLATION DEFORMATION MODEL

DIRECT TRANSFORM
X(x,y) =     -100.076  +            1 * x  +            0 * y
Y(x,y) =     -294.336  +            0 * x  +            1 * y

INVERSE TRANSFORM
x(X,Y) =      100.076  +            1 * X  +            0 * Y
y(X,Y) =      294.336  +            0 * X  +            1 * Y
```

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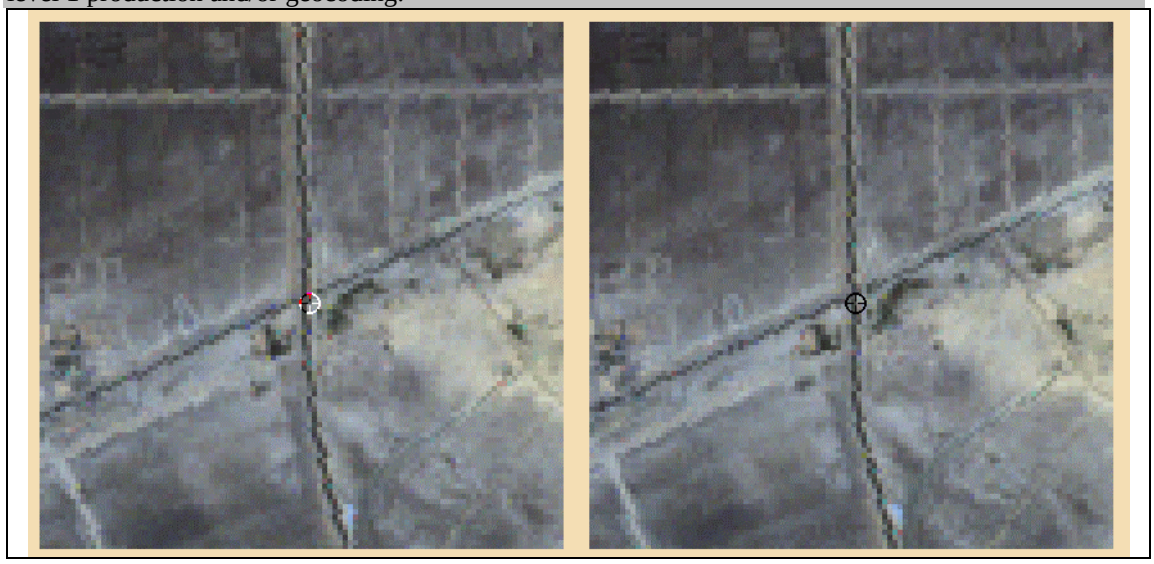
```
CONTROL POINT TRANSFORM - RMS ERROR
0     (3493.699951,3829.300049) -> (3393.624023,3534.964160)
Inv.   (3493.325928,3829.585889) <- (3393.250000,3535.250000)
1     (1450.699951,5331.299805) -> (1350.624023,5036.963916)
Inv.   (1450.775879,5331.635693) <- (1350.699951,5037.299805)
2     (6827.399902,5831.399902) -> (6727.323975,5537.064014)
Inv.   (6826.776123,5831.536084) <- (6726.700195,5537.200195)
3     (1252.599976,6625.299805) -> (1152.524048,6330.963916)
Inv.   (1253.675903,6624.635693) <- (1153.599976,6330.299805)
4     (5411.629883,6188.029785) -> (5311.553955,5893.693896)
Inv.   (5411.475830,6187.935986) <- (5311.399902,5893.600098)


Index  ErrorRank      Error              dX              dY
0         2         0.470742          0.374023       -0.285840
1         1         0.344364         -0.075928       -0.335889
2         3         0.638472          0.623779       -0.136182
3         4         1.264383         -1.075928        0.664111
4         0         0.180362          0.154053        0.093799
RMS = 0.689786
```

C2. Small differences in zoomed images

Nevertheless, we may observe here below differences between zoomed thumbnails (x4) in particular along the straight structures (roads, airports...). Even the aliasing defects usually due to swath transitions are not always located at the same position. In the same way the histogram of USGS images look more smoothed than the ones of ESA. This may be due to a difference in the way data are resampled during level 1 production and/or geocoding.



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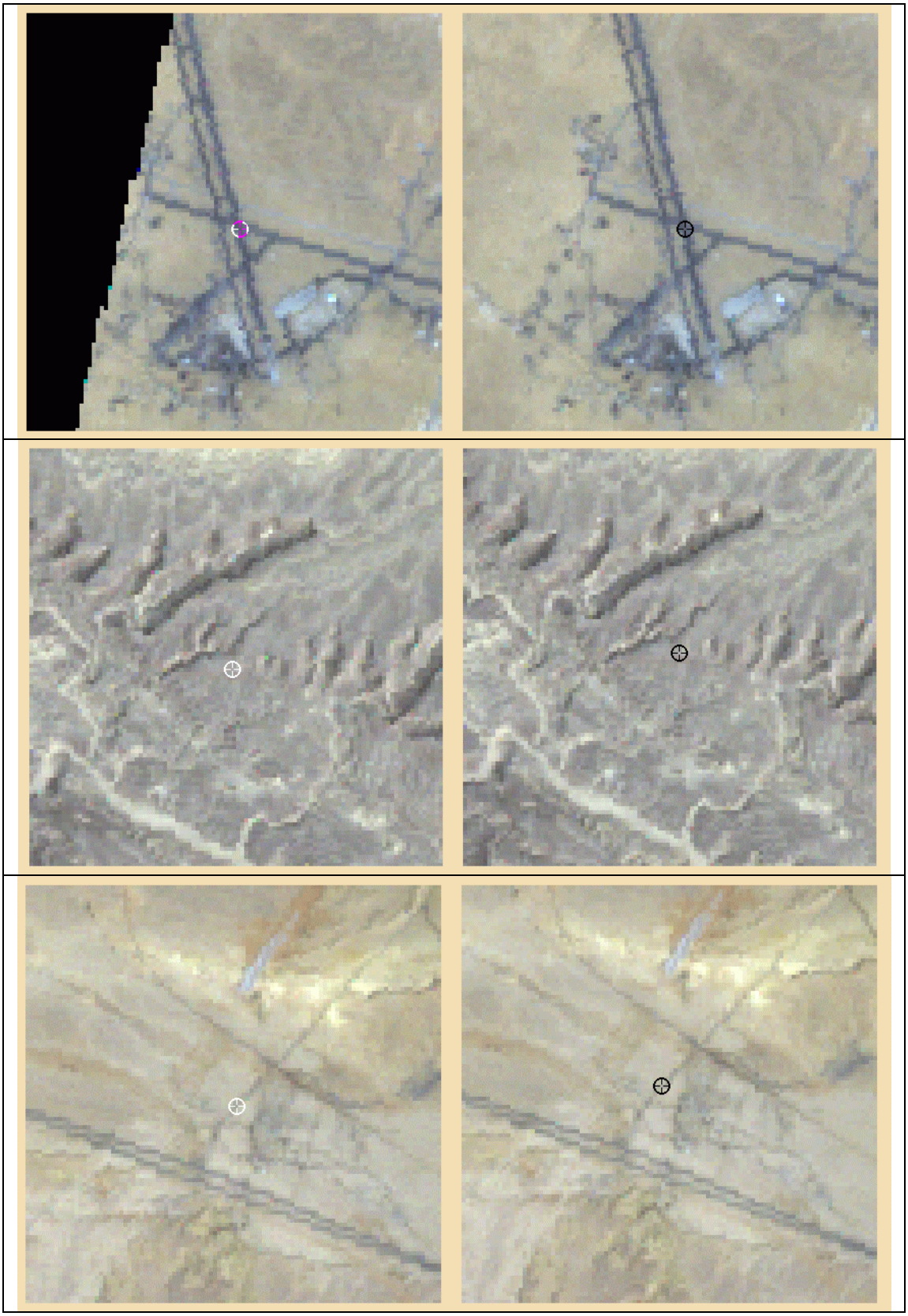

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Figure 2.8.b – Zoom of ESA scene (left) and USGS scene (right)

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Channels VNIR-SWIR 4, 5 and 7

Command:
```
REGIST -if1 dec.{4,5,6} -if2 ../176-39_20010319_USGS/dec.{4,5,6} -ift
       dec.reg123
-> snap06_176-39_REGIST_456_full.gif
```

C3. Same geometry as for channels 1,2,3

As expected (REGIST has been launched with the same tie-points as those extracted from channels 1,2,3 registration), the relative location of channels 4,5,7 of USGS images is exactly the same as the one observed previously.

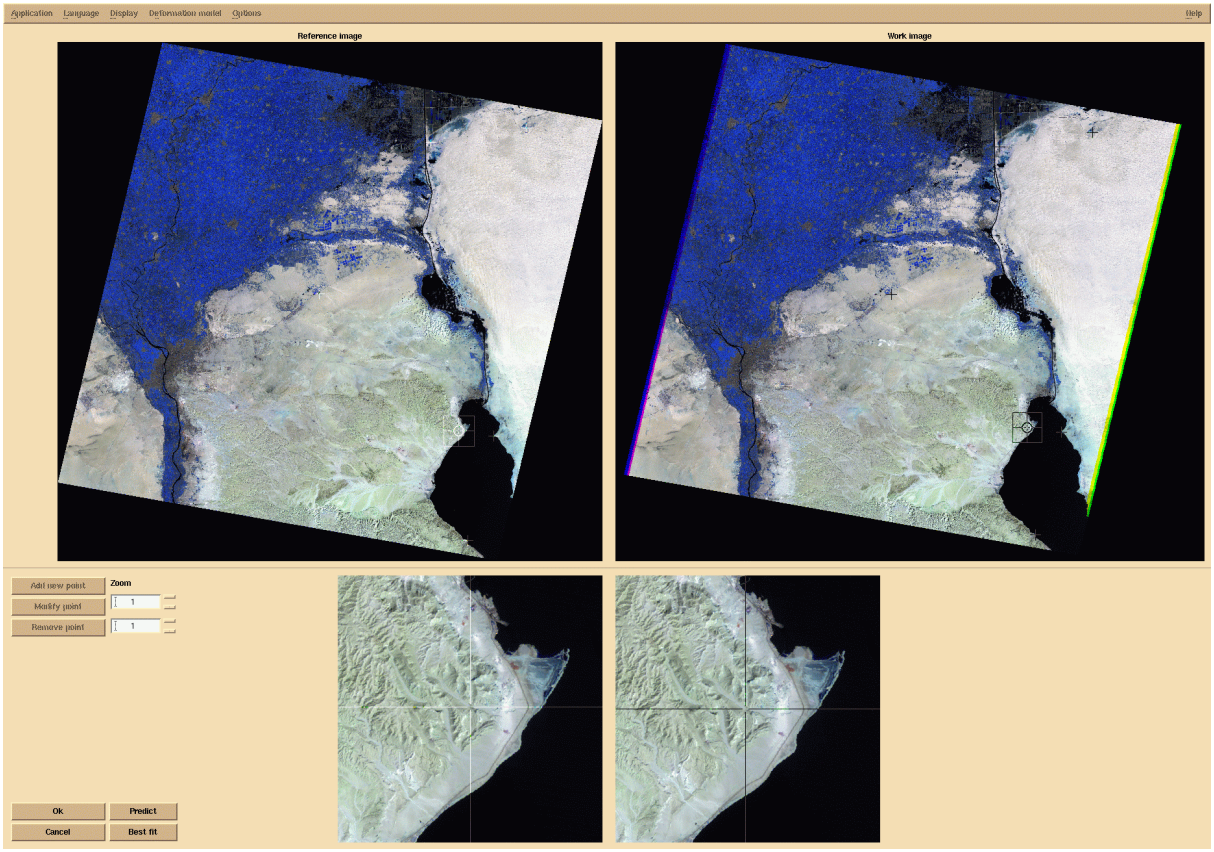

Figure 2.8.c – Registration of channels 4,5,7 from USGS scene (right) on ESA scene (left)

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Channels THERMAL 6L and 6H

Command: `REGIST -if1 dec.{7,8,8.bis} -if2 ../176-39_20010319_USGS/dec.{7,8,8.bis} -> dec.reg78`

REGIST accepts only 1 or 3 channels in input. As a consequence, band 8 has been copied into an other file (dec.8.bis).

Because band groups do not have the same resolution (30 m for ESA and 60 m for USGS), it has been necessary to use a "Scaled rotation" or "Polynomial" (degree 1) model to register USGS scene on the ESA scene.

Three (3) tie-points have been selected to produce one of these bi-linear polynomial models.

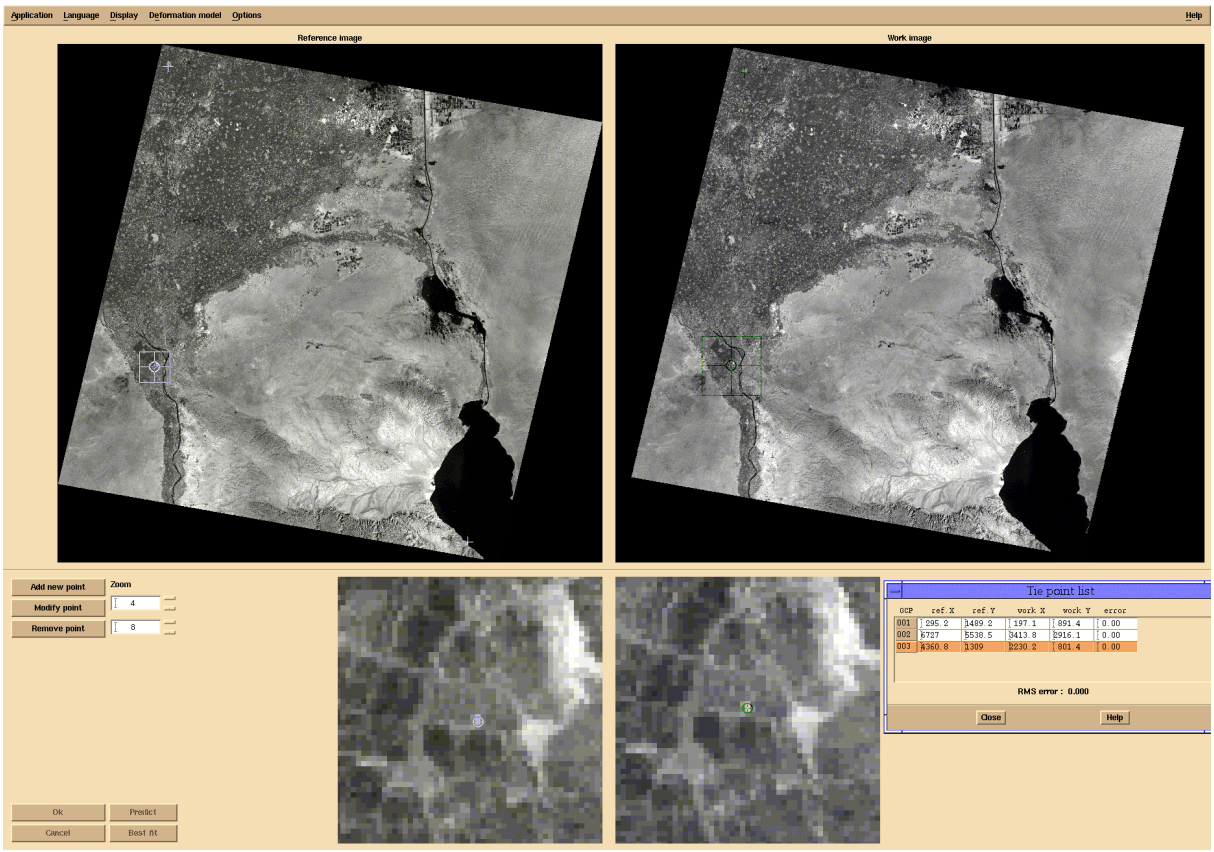

Figure 2.8.d – Registration of channels 6L,6H,6H from USGS scene (right) on ESA scene (left)

Assessment of the model and residues using a “Scaled rotation” deformation model.

Command: `DEFORM -if ../176-39_20010319_USGS/dec.7 -ift dec.reg78 -of toto -fun "Scaled rotation"`

```
SCALED ROTATION DEFORMATION MODEL
ANGLE  = 0.003849 degrees
FACTOR =      1.99969
DIRECT TRANSFORM
X(x,y) =     -98.9322  +       1.99969 * x  +  -0.000134346 * y
Y(x,y) =     -293.443  +   0.000134346 * x  +       1.99969 * y
```

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```
INVERSE TRANSFORM
x(X,Y) =      49.4838  +      0.500079 * X  +   3.35971e-05 * Y
y(X,Y) =      146.741  +  -3.35971e-05 * X  +      0.500079 * Y


CONTROL POINT TRANSFORM - RMS ERROR
  0     (197.125000,891.375000) -> (295.136114,1489.053997)
 Inv.   (197.181970,891.473017) <- (295.250000,1489.250000)
  1     (3413.750000,2916.120117) -> (6727.104080,5538.340604)
 Inv.   (3413.697948,2916.199822) <- (6727.000000,5538.500000)
  2     (2230.250000,801.375000) -> (4360.759806,1309.355399)
 Inv.   (2230.245083,801.197278) <- (4360.750000,1309.000000)


Index  ErrorRank      Error              dX               dY
  0        1         0.226687          -0.113886         -0.196003
  1        0         0.190368           0.104080         -0.159396
  2        2         0.355534           0.009806          0.355399
RMS = 0.267103
```

C4. Same geometry

As shown in the statistics here above, USGS scene may be superimposed on ESA scene with a scaling factor of 2 and a null angle.

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Radiometric correlation

After having registered USGS over ESA scenes, a radiometric correlation is computed ("Color matching" function of REGIST process).

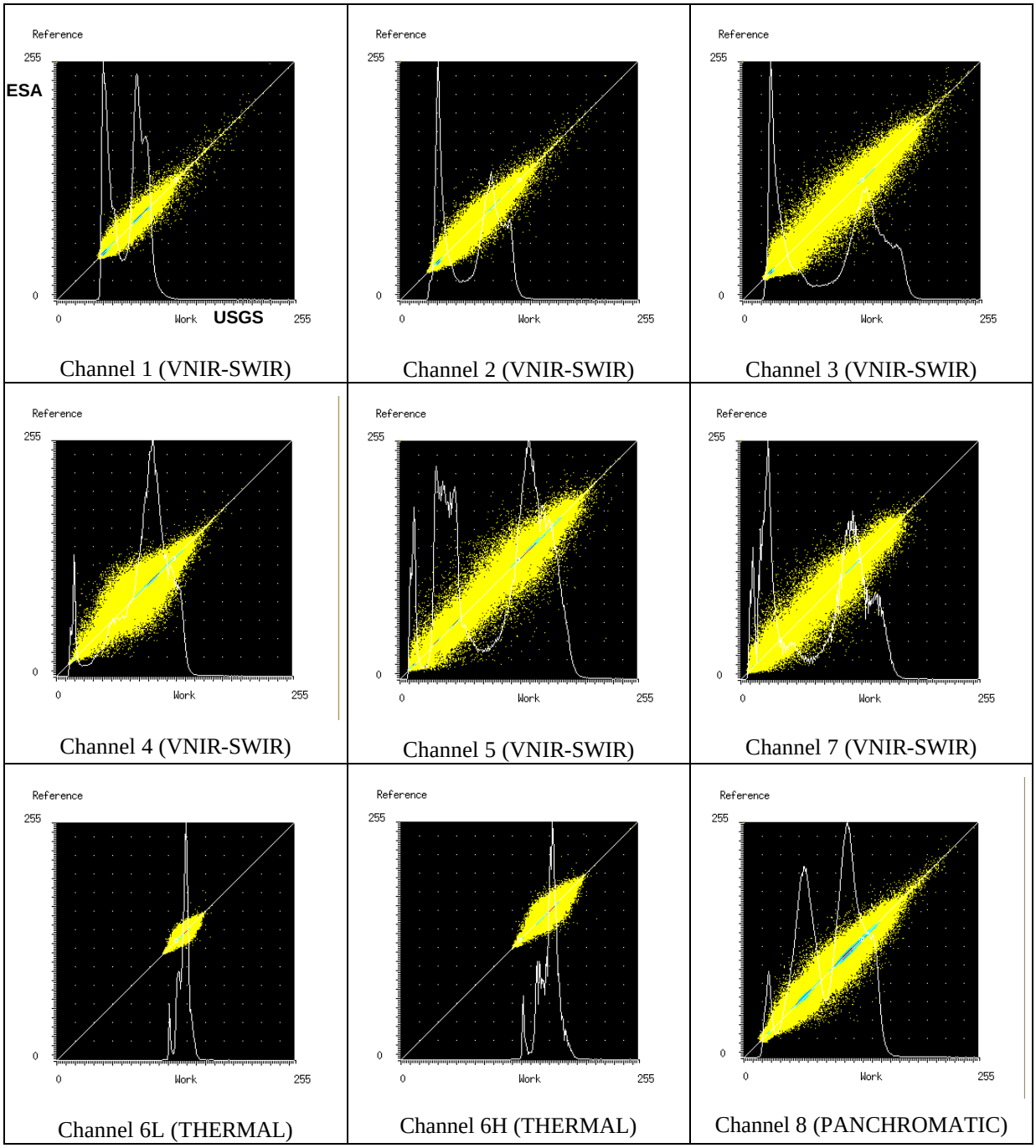

Figure 2.8.e – Correlation analysis between the radiometry of ESA and USGS scenes

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C5. High radiometric correlation

This linear regression analysis shows that the ESA and USGS images are highly correlated. Almost all the occurrences of the bi-dimensional histogram are located along the principal diagonal meaning that colors of ESA and USGS scenes are the same. The same gains and biases should have been applied in ESA and USGS channels.

C6. Small local variations

Nevertheless, the observed dispersion (shown in yellow) of low occurrences illustrates the color changes due to small local variations of the geometry and/or a difference in the resampling method.

Analysis of gain and biases

Values found within header files

VNIR-SWIR

GAINS AND BIASES IN ASCENDING BAND NUMBER ORDER (ESA)

-6.200000000000000	1.176078431372549
-6.400000000000000	1.205098039215686
-5.000000000000000	0.938823529411765
-5.100000000000000	0.965490196078431
-1.000000000000000	0.190470588235294
-0.350000000000000	0.066235294117647

GAINS

BIASES

BIASES AND GAINS IN ASCENDING BAND NUMBER ORDER (USGS)

-7.380708517990713	1.180708708725576
-7.609842591398344	1.209842496030913
-5.942519661009781	0.942519661009781
-6.069291266869373	0.969291362236804
-1.191220471239465	0.191220471239465
-0.416496060612633	0.066496066573098

THERMAL

GAINS AND BIASES IN ASCENDING BAND NUMBER ORDER (ESA)

0.000000000000000	0.066823529411765
3.200000000000000	0.037058823529412

BIASES AND GAINS IN ASCENDING BAND NUMBER ORDER (USGS)

-0.067086617777667	0.067086617777667
3.162795324963847	0.037204722719868

PANCHROMATIC

GAINS AND BIASES IN ASCENDING BAND NUMBER ORDER (ESA)

-4.700000000000000	0.971764705882353

BIASES AND GAINS IN ASCENDING BAND NUMBER ORDER (USGS)

-5.675590383724904	0.975590574459767

C7. Compliance with format document

ESA ancillary data of the radiometric record are fully compliant with the document specifying the format [R-1].

USGS data shows the following misalignment:

- Label "BIASES AND GAINS..." in place of "GAINS AND BIASES...".

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- Data format "D24.15" not strictly applied even if the number of significant digits is respected

C8. Gains and biases values are not the same

Gains and biases are surprisingly not exactly the same. In particular, ESA bias has less significant digits and looks proportional to the USGS bias (see figure 2.8.f).

As shown by the figure here below, ESA and USGS are exactly proportional with a 254/255 factor.

Nevertheless, the difference of these values stays low and has not been detected by the radiometry correlation analysis (see here above "Radiometric correlation").

Note: The relation between ESA and USGS radiometric coefficients should be clarified. Unfortunately we have not found a definition neither rules of use for these coefficients. The only definition found has been encountered in the "README.FF7" file of the USGS distribution: "*Radiometric Record: Contains the coefficients needed to convert the image values into at-satellite spectral radiance for each particular band.*"

	ESA BIAS	ESA GAIN	USGS BIAS	USGS GAIN	BIAS DIFFERENCE	GAIN DIFFERENCE	GAIN RATIO (ESA/USGS)	GAIN RATIO x 255
VNIR/SWIR 1	-6,2	1,176078431	-7,380708518	1,180708709	-1,180708518	0,004630277	0,996078391	253,9999898
VNIR/SWIR 2	-6,4	1,205098039	-7,609842591	1,209842496	-1,209842591	0,004744457	0,996078451	254,000005
VNIR/SWIR 3	-5	0,938823529	-5,942519661	0,942519661	-0,942519661	0,003696132	0,996078457	254,0000065
VNIR/SWIR 4	-5,1	0,965490196	-6,069291267	0,969291362	-0,969291267	0,003801166	0,996078407	253,9999938
VNIR/SWIR 5	-1	0,190470588	-1,191220471	0,191220471	-0,191220471	0,000749883	0,996078438	254,0000016
VNIR/SWIR 7	-0,35	0,066235294	-0,416496061	0,066496067	-0,066496061	0,000260772	0,996078378	253,9999863
THERMAL 6L	0	0,066823529	-0,067086618	0,067086618	-0,067086618	0,000263088	0,996078378	253,9999864
THERMAL 6H	3,2	0,037058824	3,162795325	0,037204723	-0,037204675	0,000145899	0,996078477	254,0000115
PANCHROMATIC	-4,7	0,971764706	-5,675590384	0,975590574	-0,975590384	0,003825869	0,996078408	253,9999939

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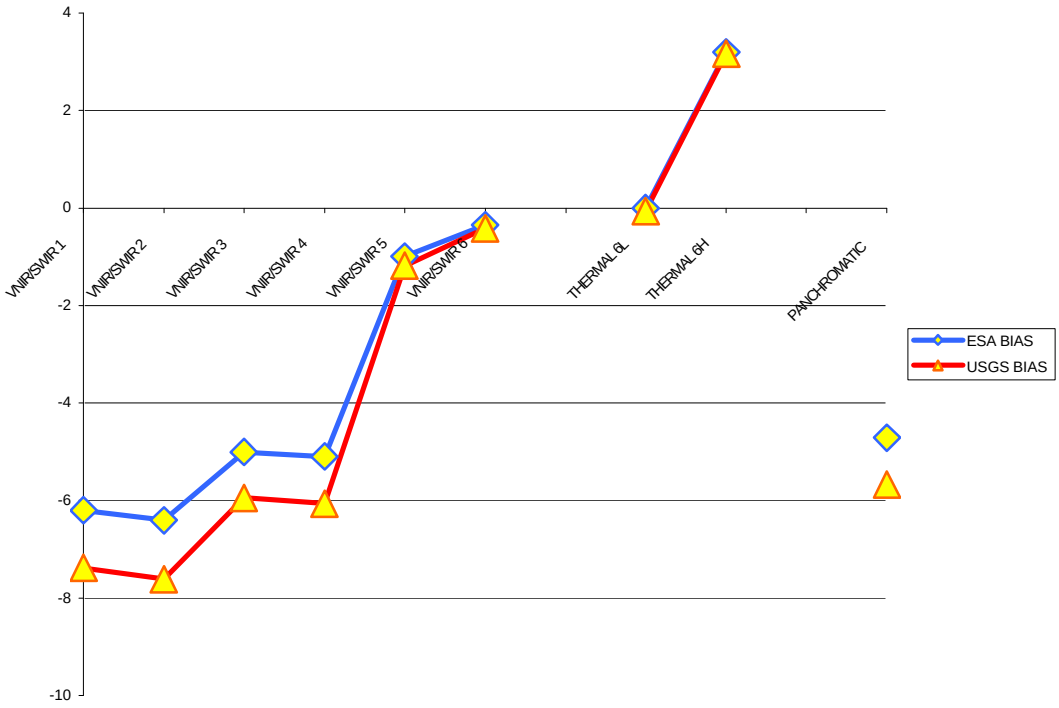

Figure 2.8.f – Relation between ESA and USGS biases

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Histogram comparison

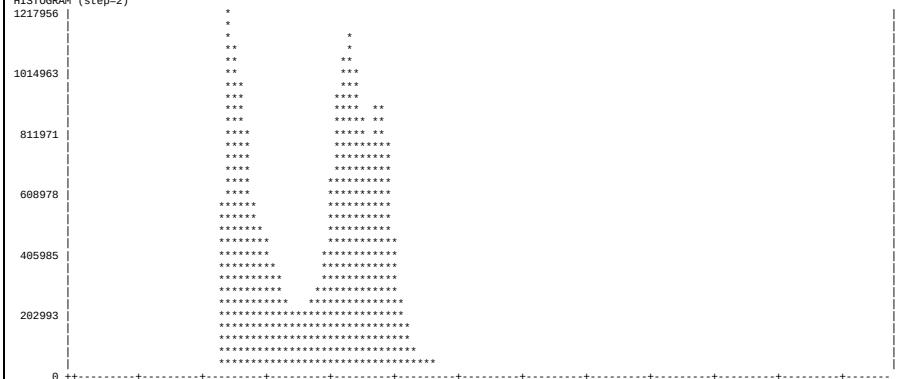
Tables here below display for each channel base statistics and histogram of ESA scene interleaved with statistics of USGS scene.

ESA – Channel 1 (VNIR-SWIR)

```
FILE dec.1

TOTAL NUMBER OF PIXELS =    51577456
IMAGE PIXELS           =    36792771 (71.33%)
BACKGROUND PIXELS      =    14784685 (28.67%)
MINIMUM                =          42
MAXIMUM                =         253
LEFT  BOUND 2%         =          47
RIGHT BOUND 2%         =         106
MEAN                   =      76.104
VARIANCE               =     353.477
STANDARD DEVIATION     =      18.801
```

HISTOGRAM (step=2)



[0]=	0 (0.00%, 0.00%)	[52]=	980365 (2.66%, 17.15%)	[104]=	172689 (0.47%, 97.44%)	[156]=	894 (0.00%, 99.95%)	[208]=	61 (0.00%,100.00%)
[1]=	0 (0.00%, 0.00%)	[53]=	937154 (2.55%, 19.69%)	[105]=	139649 (0.38%, 97.82%)	[157]=	785 (0.00%, 99.95%)	[209]=	67 (0.00%,100.00%)
[2]=	0 (0.00%, 0.00%)	[54]=	837624 (2.28%, 21.97%)	[106]=	111296 (0.30%, 98.12%)	[158]=	794 (0.00%, 99.96%)	[210]=	58 (0.00%,100.00%)
[3]=	0 (0.00%, 0.00%)	[55]=	731856 (1.99%, 23.96%)	[107]=	91800 (0.25%, 98.37%)	[159]=	705 (0.00%, 99.96%)	[211]=	50 (0.00%,100.00%)
[4]=	0 (0.00%, 0.00%)	[56]=	581282 (1.58%, 25.54%)	[108]=	78303 (0.21%, 98.59%)	[160]=	706 (0.00%, 99.96%)	[212]=	74 (0.00%,100.00%)
[5]=	0 (0.00%, 0.00%)	[57]=	554646 (1.51%, 27.05%)	[109]=	67760 (0.18%, 98.77%)	[161]=	694 (0.00%, 99.96%)	[213]=	60 (0.00%,100.00%)
[6]=	0 (0.00%, 0.00%)	[58]=	494080 (1.34%, 28.39%)	[110]=	55591 (0.15%, 98.92%)	[162]=	683 (0.00%, 99.96%)	[214]=	62 (0.00%,100.00%)
[7]=	0 (0.00%, 0.00%)	[59]=	495392 (1.35%, 29.74%)	[111]=	50743 (0.14%, 99.06%)	[163]=	570 (0.00%, 99.97%)	[215]=	52 (0.00%,100.00%)
[8]=	0 (0.00%, 0.00%)	[60]=	484996 (1.32%, 31.05%)	[112]=	42664 (0.12%, 99.17%)	[164]=	617 (0.00%, 99.97%)	[216]=	44 (0.00%,100.00%)
[9]=	0 (0.00%, 0.00%)	[61]=	438893 (1.19%, 32.25%)	[113]=	35891 (0.10%, 99.27%)	[165]=	576 (0.00%, 99.97%)	[217]=	43 (0.00%,100.00%)
[10]=	0 (0.00%, 0.00%)	[62]=	405371 (1.10%, 33.35%)	[114]=	28503 (0.08%, 99.35%)	[166]=	482 (0.00%, 99.97%)	[218]=	24 (0.00%,100.00%)
[11]=	0 (0.00%, 0.00%)	[63]=	361812 (0.98%, 34.33%)	[115]=	23177 (0.06%, 99.41%)	[167]=	502 (0.00%, 99.97%)	[219]=	29 (0.00%,100.00%)
[12]=	0 (0.00%, 0.00%)	[64]=	339311 (0.92%, 35.25%)	[116]=	22793 (0.06%, 99.47%)	[168]=	513 (0.00%, 99.97%)	[220]=	36 (0.00%,100.00%)
[13]=	0 (0.00%, 0.00%)	[65]=	217589 (0.59%, 35.85%)	[117]=	18663 (0.05%, 99.53%)	[169]=	477 (0.00%, 99.97%)	[221]=	25 (0.00%,100.00%)
[14]=	0 (0.00%, 0.00%)	[66]=	254698 (0.69%, 36.54%)	[118]=	17214 (0.05%, 99.57%)	[170]=	482 (0.00%, 99.98%)	[222]=	28 (0.00%,100.00%)
[15]=	0 (0.00%, 0.00%)	[67]=	246346 (0.67%, 37.21%)	[119]=	13321 (0.04%, 99.61%)	[171]=	494 (0.00%, 99.98%)	[223]=	35 (0.00%,100.00%)
[16]=	0 (0.00%, 0.00%)	[68]=	235863 (0.64%, 37.85%)	[120]=	13463 (0.04%, 99.65%)	[172]=	333 (0.00%, 99.98%)	[224]=	23 (0.00%,100.00%)
[17]=	0 (0.00%, 0.00%)	[69]=	209045 (0.57%, 38.42%)	[121]=	10477 (0.03%, 99.67%)	[173]=	315 (0.00%, 99.98%)	[225]=	23 (0.00%,100.00%)
[18]=	0 (0.00%, 0.00%)	[70]=	217876 (0.59%, 39.01%)	[122]=	9523 (0.03%, 99.70%)	[174]=	360 (0.00%, 99.98%)	[226]=	24 (0.00%,100.00%)
[19]=	0 (0.00%, 0.00%)	[71]=	219173 (0.60%, 39.60%)	[123]=	9502 (0.03%, 99.73%)	[175]=	372 (0.00%, 99.98%)	[227]=	15 (0.00%,100.00%)
[20]=	0 (0.00%, 0.00%)	[72]=	217685 (0.59%, 40.20%)	[124]=	8323 (0.02%, 99.75%)	[176]=	339 (0.00%, 99.98%)	[228]=	22 (0.00%,100.00%)
[21]=	0 (0.00%, 0.00%)	[73]=	211919 (0.58%, 40.77%)	[125]=	6798 (0.02%, 99.77%)	[177]=	349 (0.00%, 99.98%)	[229]=	16 (0.00%,100.00%)
[22]=	0 (0.00%, 0.00%)	[74]=	234076 (0.64%, 41.41%)	[126]=	5937 (0.02%, 99.78%)	[178]=	307 (0.00%, 99.98%)	[230]=	21 (0.00%,100.00%)
[23]=	0 (0.00%, 0.00%)	[75]=	253281 (0.69%, 42.10%)	[127]=	5376 (0.01%, 99.80%)	[179]=	325 (0.00%, 99.98%)	[231]=	19 (0.00%,100.00%)
[24]=	0 (0.00%, 0.00%)	[76]=	279847 (0.76%, 42.86%)	[128]=	4746 (0.01%, 99.81%)	[180]=	281 (0.00%, 99.99%)	[232]=	15 (0.00%,100.00%)
[25]=	0 (0.00%, 0.00%)	[77]=	293488 (0.80%, 43.65%)	[129]=	4528 (0.01%, 99.82%)	[181]=	296 (0.00%, 99.99%)	[233]=	13 (0.00%,100.00%)
[26]=	0 (0.00%, 0.00%)	[78]=	353213 (0.96%, 44.62%)	[130]=	4075 (0.01%, 99.83%)	[182]=	277 (0.00%, 99.99%)	[234]=	8 (0.00%,100.00%)
[27]=	0 (0.00%, 0.00%)	[79]=	432617 (1.18%, 45.79%)	[131]=	3569 (0.01%, 99.84%)	[183]=	252 (0.00%, 99.99%)	[235]=	16 (0.00%,100.00%)
[28]=	0 (0.00%, 0.00%)	[80]=	499765 (1.36%, 47.15%)	[132]=	3135 (0.01%, 99.85%)	[184]=	245 (0.00%, 99.99%)	[236]=	6 (0.00%,100.00%)
[29]=	0 (0.00%, 0.00%)	[81]=	665526 (1.81%, 48.96%)	[133]=	2935 (0.01%, 99.86%)	[185]=	241 (0.00%, 99.99%)	[237]=	8 (0.00%,100.00%)
[30]=	0 (0.00%, 0.00%)	[82]=	864735 (2.35%, 51.31%)	[134]=	2333 (0.01%, 99.87%)	[186]=	258 (0.00%, 99.99%)	[238]=	12 (0.00%,100.00%)
[31]=	0 (0.00%, 0.00%)	[83]=	943570 (2.56%, 53.87%)	[135]=	2325 (0.01%, 99.87%)	[187]=	229 (0.00%, 99.99%)	[239]=	11 (0.00%,100.00%)
[32]=	0 (0.00%, 0.00%)	[84]=1037194 (2.82%, 56.69%)	[136]=	2326 (0.01%, 99.88%)	[188]=	184 (0.00%, 99.99%)	[240]=	5 (0.00%,100.00%)
[33]=	0 (0.00%, 0.00%)	[85]=1086999 (2.95%, 59.65%)	[137]=	2073 (0.01%, 99.88%)	[189]=	158 (0.00%, 99.99%)	[241]=	5 (0.00%,100.00%)
[34]=	0 (0.00%, 0.00%)	[86]=1172942 (3.19%, 62.83%)	[138]=	2017 (0.01%, 99.89%)	[190]=	186 (0.00%, 99.99%)	[242]=	7 (0.00%,100.00%)
[35]=	0 (0.00%, 0.00%)	[87]=1116440 (3.03%, 65.87%)	[139]=	1914 (0.01%, 99.89%)	[191]=	167 (0.00%, 99.99%)	[243]=	6 (0.00%,100.00%)
[36]=	0 (0.00%, 0.00%)	[88]=1035148 (2.81%, 68.68%)	[140]=	1839 (0.00%, 99.90%)	[192]=	170 (0.00%, 99.99%)	[244]=	5 (0.00%,100.00%)
[37]=	0 (0.00%, 0.00%)	[89]= 896210 (2.44%, 71.12%)	[141]=	1583 (0.00%, 99.90%)	[193]=	130 (0.00%, 99.99%)	[245]=	3 (0.00%,100.00%)
[38]=	0 (0.00%, 0.00%)	[90]= 846288 (2.30%, 73.42%)	[142]=	1707 (0.00%, 99.91%)	[194]=	137 (0.00%, 99.99%)	[246]=	8 (0.00%,100.00%)
[39]=	0 (0.00%, 0.00%)	[91]= 860773 (2.34%, 75.76%)	[143]=	1669 (0.00%, 99.91%)	[195]=	156 (0.00%, 99.99%)	[247]=	5 (0.00%,100.00%)
[40]=	0 (0.00%, 0.00%)	[92]= 800715 (2.18%, 77.93%)	[144]=	1441 (0.00%, 99.92%)	[196]=	126 (0.00%, 99.99%)	[248]=	1 (0.00%,100.00%)
[41]=	0 (0.00%, 0.00%)	[93]= 746391 (2.03%, 79.96%)	[145]=	1314 (0.00%, 99.92%)	[197]=	120 (0.00%, 99.99%)	[249]=	2 (0.00%,100.00%)
[42]=	2 (0.00%, 0.00%)	[94]= 924675 (2.24%, 82.20%)	[146]=	1276 (0.00%, 99.93%)	[198]=	140 (0.00%, 99.99%)	[250]=	2 (0.00%,100.00%)
[43]= 144 (0.00%, 0.00%)	[95]= 897478 (2.44%, 84.64%)	[147]=	1297 (0.00%, 99.93%)	[199]=	127 (0.00%,100.00%)	[251]=	1 (0.00%,100.00%)
[44]= 2731 (0.01%, 0.01%)	[96]= 908214 (2.47%, 87.11%)	[148]=	1182 (0.00%, 99.93%)	[200]=	109 (0.00%,100.00%)	[252]=	2 (0.00%,100.00%)
[45]= 35149 (0.10%, 0.10%)	[97]= 875922 (2.38%, 89.49%)	[149]=	945 (0.00%, 99.93%)	[201]=	110 (0.00%,100.00%)	[253]=	3 (0.00%,100.00%)
[46]= 189356 (0.51%, 0.62%)	[98]= 779731 (2.12%, 91.61%)	[150]=	970 (0.00%, 99.94%)	[202]=	108 (0.00%,100.00%)	[254]=	0 (0.00%,100.00%)
[47]= 575696 (1.56%, 2.18%)	[99]= 620938 (1.69%, 93.30%)	[151]=	1168 (0.00%, 99.94%)	[203]=	94 (0.00%,100.00%)	[255]=	0 (0.00%,100.00%)
[48]=1064489 (2.89%, 5.08%)	[100]= 483579 (1.31%, 94.61%)	[152]=	1076 (0.00%, 99.94%)	[204]=	100 (0.00%,100.00%)
[49]=1217956 (3.31%, 8.39%)	[101]= 377624 (1.03%, 95.64%)	[153]=	1015 (0.00%, 99.95%)	[205]=	82 (0.00%,100.00%)
[50]=1132863 (3.08%, 11.47%)	[102]= 266487 (0.72%, 96.36%)	[154]=	1006 (0.00%, 99.95%)	[206]=	84 (0.00%,100.00%)
[51]=1109828 (3.02%, 14.48%)	[103]= 223590 (0.61%, 96.97%)	[155]=	830 (0.00%, 99.95%)	[207]=	79 (0.00%,100.00%)

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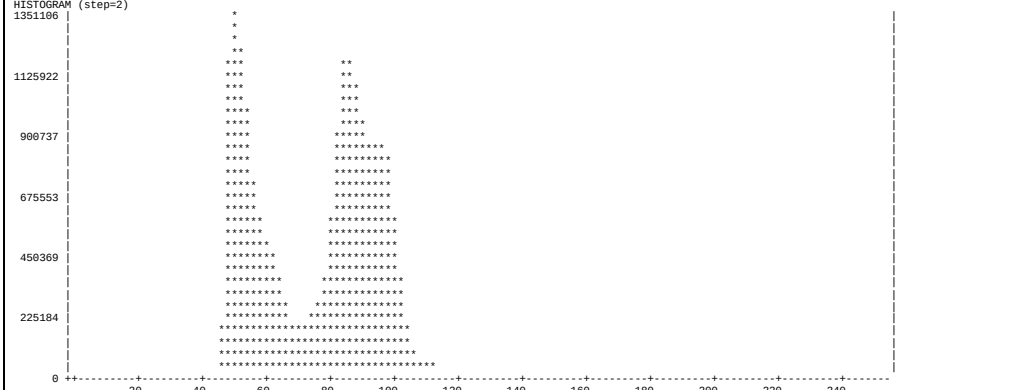
USGS – Channel 1 (VNIR-SWIR)

```
FILE dec.1

TOTAL NUMBER OF PIXELS =    58911381
IMAGE PIXELS           =    38981366 (66.17%)
BACKGROUND PIXELS      =    19930015 (33.83%)
MINIMUM                =           3
MAXIMUM                =         254
LEFT  BOUND 2%         =          48
RIGHT BOUND 2%         =         107
MEAN                   =      76.339
VARIANCE               =     359.106
STANDARD DEVIATION     =      18.950
```

HISTOGRAM (step=2)




```
[  0]=      0 ( 0.00%,  0.00%)  [ 52]=1228381 ( 3.15%, 15.57%)  [104]= 210000 ( 0.54%, 97.26%)  [156]=    900 ( 0.00%, 99.95%)  [208]=     62 ( 0.00%,100.00%)
[  1]=      0 ( 0.00%,  0.00%)  [ 53]=1135442 ( 2.91%, 18.48%)  [105]= 159605 ( 0.41%, 97.67%)  [157]=    847 ( 0.00%, 99.96%)  [209]=     72 ( 0.00%,100.00%)
[  2]=      0 ( 0.00%,  0.00%)  [ 54]=1000085 ( 2.57%, 21.04%)  [106]= 126462 ( 0.32%, 98.00%)  [158]=    793 ( 0.00%, 99.96%)  [210]=     59 ( 0.00%,100.00%)
[  3]=      1 ( 0.00%,  0.00%)  [ 55]=  897277 ( 2.30%, 23.35%)  [107]= 104748 ( 0.27%, 98.26%)  [159]=    751 ( 0.00%, 99.96%)  [211]=     56 ( 0.00%,100.00%)
[  4]=    161 ( 0.00%,  0.00%)  [ 56]= 763914 ( 1.96%, 25.31%)  [108]=  89064 ( 0.23%, 98.49%)  [160]=    699 ( 0.00%, 99.96%)  [212]=     69 ( 0.00%,100.00%)
[  5]=   3216 ( 0.01%,  0.01%)  [ 57]= 694815 ( 1.78%, 27.09%)  [109]=  77197 ( 0.20%, 98.69%)  [161]=    695 ( 0.00%, 99.96%)  [213]=     76 ( 0.00%,100.00%)
[  6]=  15164 ( 0.04%,  0.05%)  [ 58]= 597034 ( 1.53%, 28.62%)  [110]=  66544 ( 0.17%, 98.86%)  [162]=    609 ( 0.00%, 99.97%)  [214]=     59 ( 0.00%,100.00%)
[  7]=  16768 ( 0.04%,  0.09%)  [ 59]= 515506 ( 1.32%, 29.94%)  [111]=  56755 ( 0.15%, 99.01%)  [163]=    576 ( 0.00%, 99.97%)  [215]=     43 ( 0.00%,100.00%)
[  8]=   5361 ( 0.01%,  0.10%)  [ 60]= 503915 ( 1.29%, 31.24%)  [112]=  48373 ( 0.12%, 99.13%)  [164]=    616 ( 0.00%, 99.97%)  [216]=     35 ( 0.00%,100.00%)
[  9]=   1543 ( 0.00%,  0.11%)  [ 61]= 506406 ( 1.30%, 32.53%)  [113]=  40406 ( 0.10%, 99.23%)  [165]=    606 ( 0.00%, 99.97%)  [217]=     53 ( 0.00%,100.00%)
[ 10]=    974 ( 0.00%,  0.11%)  [ 62]= 482131 ( 1.24%, 33.77%)  [114]=  35440 ( 0.09%, 99.33%)  [166]=    499 ( 0.00%, 99.97%)  [218]=     30 ( 0.00%,100.00%)
[ 11]=    701 ( 0.00%,  0.11%)  [ 63]= 428878 ( 1.10%, 34.87%)  [115]=  29985 ( 0.08%, 99.40%)  [167]=    533 ( 0.00%, 99.97%)  [219]=     27 ( 0.00%,100.00%)
[ 12]=    585 ( 0.00%,  0.11%)  [ 64]= 374646 ( 0.96%, 35.83%)  [116]=  25676 ( 0.07%, 99.47%)  [168]=    505 ( 0.00%, 99.97%)  [220]=     33 ( 0.00%,100.00%)
[ 13]=    487 ( 0.00%,  0.12%)  [ 65]= 308979 ( 0.79%, 36.62%)  [117]=  20783 ( 0.05%, 99.52%)  [169]=    483 ( 0.00%, 99.98%)  [221]=     29 ( 0.00%,100.00%)
[ 14]=    421 ( 0.00%,  0.12%)  [ 66]= 274897 ( 0.71%, 37.33%)  [118]=  17678 ( 0.05%, 99.57%)  [170]=    476 ( 0.00%, 99.98%)  [222]=     25 ( 0.00%,100.00%)
[ 15]=    514 ( 0.00%,  0.12%)  [ 67]= 248781 ( 0.64%, 37.97%)  [119]=  15940 ( 0.04%, 99.61%)  [171]=    450 ( 0.00%, 99.98%)  [223]=     32 ( 0.00%,100.00%)
[ 16]=    486 ( 0.00%,  0.12%)  [ 68]= 224918 ( 0.58%, 38.55%)  [120]=  13956 ( 0.04%, 99.64%)  [172]=    395 ( 0.00%, 99.98%)  [224]=     18 ( 0.00%,100.00%)
[ 17]=    522 ( 0.00%,  0.12%)  [ 69]= 218589 ( 0.56%, 39.11%)  [121]=  12597 ( 0.03%, 99.68%)  [173]=    372 ( 0.00%, 99.98%)  [225]=     22 ( 0.00%,100.00%)
[ 18]=    490 ( 0.00%,  0.12%)  [ 70]= 207056 ( 0.53%, 39.64%)  [122]=  11087 ( 0.03%, 99.70%)  [174]=    346 ( 0.00%, 99.98%)  [226]=     21 ( 0.00%,100.00%)
[ 19]=    531 ( 0.00%,  0.12%)  [ 71]= 205346 ( 0.53%, 40.16%)  [123]=   9844 ( 0.03%, 99.73%)  [175]=    364 ( 0.00%, 99.98%)  [227]=     24 ( 0.00%,100.00%)
[ 20]=    500 ( 0.00%,  0.12%)  [ 72]= 217552 ( 0.56%, 40.72%)  [124]=   8551 ( 0.02%, 99.75%)  [176]=    349 ( 0.00%, 99.98%)  [228]=     19 ( 0.00%,100.00%)
[ 21]=    516 ( 0.00%,  0.13%)  [ 73]= 216791 ( 0.56%, 41.28%)  [125]=   7361 ( 0.02%, 99.77%)  [177]=    327 ( 0.00%, 99.98%)  [229]=     19 ( 0.00%,100.00%)
[ 22]=    487 ( 0.00%,  0.13%)  [ 74]= 228596 ( 0.59%, 41.86%)  [126]=   6317 ( 0.02%, 99.79%)  [178]=    343 ( 0.00%, 99.98%)  [230]=     16 ( 0.00%,100.00%)
[ 23]=    536 ( 0.00%,  0.13%)  [ 75]= 240255 ( 0.62%, 42.48%)  [127]=   5311 ( 0.01%, 99.80%)  [179]=    293 ( 0.00%, 99.99%)  [231]=     21 ( 0.00%,100.00%)
[ 24]=    524 ( 0.00%,  0.13%)  [ 76]= 259139 ( 0.66%, 43.15%)  [128]=   5038 ( 0.01%, 99.81%)  [180]=    302 ( 0.00%, 99.99%)  [232]=     11 ( 0.00%,100.00%)
[ 25]=    527 ( 0.00%,  0.13%)  [ 77]= 283796 ( 0.73%, 43.87%)  [129]=   4475 ( 0.01%, 99.82%)  [181]=    302 ( 0.00%, 99.99%)  [233]=     15 ( 0.00%,100.00%)
[ 26]=    584 ( 0.00%,  0.13%)  [ 78]= 322067 ( 0.83%, 44.70%)  [130]=   4165 ( 0.01%, 99.84%)  [182]=    257 ( 0.00%, 99.99%)  [234]=     14 ( 0.00%,100.00%)
[ 27]=    593 ( 0.00%,  0.13%)  [ 79]= 388976 ( 1.00%, 45.70%)  [131]=   3826 ( 0.01%, 99.85%)  [183]=    295 ( 0.00%, 99.99%)  [235]=     14 ( 0.00%,100.00%)
[ 28]=    615 ( 0.00%,  0.14%)  [ 80]= 479859 ( 1.23%, 46.93%)  [132]=   3413 ( 0.01%, 99.85%)  [184]=    229 ( 0.00%, 99.99%)  [236]=      5 ( 0.00%,100.00%)
[ 29]=    647 ( 0.00%,  0.14%)  [ 81]= 600357 ( 1.54%, 48.47%)  [133]=   3092 ( 0.01%, 99.86%)  [185]=    239 ( 0.00%, 99.99%)  [237]=      5 ( 0.00%,100.00%)
[ 30]=    656 ( 0.00%,  0.14%)  [ 82]= 725381 ( 1.86%, 50.33%)  [134]=   2749 ( 0.01%, 99.87%)  [186]=    235 ( 0.00%, 99.99%)  [238]=     16 ( 0.00%,100.00%)
[ 31]=    605 ( 0.00%,  0.14%)  [ 83]= 919729 ( 2.36%, 52.69%)  [135]=   2583 ( 0.01%, 99.88%)  [187]=    234 ( 0.00%, 99.99%)  [239]=      8 ( 0.00%,100.00%)
[ 32]=    662 ( 0.00%,  0.14%)  [ 84]=1052033 ( 2.70%, 55.39%)  [136]=   2411 ( 0.01%, 99.88%)  [188]=    200 ( 0.00%, 99.99%)  [240]=      9 ( 0.00%,100.00%)
[ 33]=    620 ( 0.00%,  0.14%)  [ 85]=1174438 ( 3.01%, 58.40%)  [137]=   2294 ( 0.01%, 99.89%)  [189]=    172 ( 0.00%, 99.99%)  [241]=      3 ( 0.00%,100.00%)
[ 34]=    629 ( 0.00%,  0.15%)  [ 86]=1206968 ( 3.10%, 61.50%)  [138]=   2036 ( 0.01%, 99.89%)  [190]=    177 ( 0.00%, 99.99%)  [242]=      9 ( 0.00%,100.00%)
[ 35]=    634 ( 0.00%,  0.15%)  [ 87]=1194993 ( 3.07%, 64.56%)  [139]=   2033 ( 0.01%, 99.90%)  [191]=    200 ( 0.00%, 99.99%)  [243]=      6 ( 0.00%,100.00%)
[ 36]=    583 ( 0.00%,  0.15%)  [ 88]=1115453 ( 2.86%, 67.42%)  [140]=   1892 ( 0.00%, 99.90%)  [192]=    165 ( 0.00%, 99.99%)  [244]=      3 ( 0.00%,100.00%)
[ 37]=    591 ( 0.00%,  0.15%)  [ 89]=1036242 ( 2.66%, 70.08%)  [141]=   1780 ( 0.00%, 99.91%)  [193]=    168 ( 0.00%, 99.99%)  [245]=      5 ( 0.00%,100.00%)
[ 38]=    568 ( 0.00%,  0.15%)  [ 90]= 978515 ( 2.51%, 72.59%)  [142]=   1669 ( 0.00%, 99.91%)  [194]=    139 ( 0.00%, 99.99%)  [246]=      2 ( 0.00%,100.00%)
[ 39]=    573 ( 0.00%,  0.15%)  [ 91]= 887175 ( 2.28%, 74.87%)  [143]=   1612 ( 0.00%, 99.92%)  [195]=    130 ( 0.00%, 99.99%)  [247]=      6 ( 0.00%,100.00%)
[ 40]=    514 ( 0.00%,  0.15%)  [ 92]= 854298 ( 2.19%, 77.06%)  [144]=   1472 ( 0.00%, 99.92%)  [196]=    146 ( 0.00%, 99.99%)  [248]=      1 ( 0.00%,100.00%)
[ 41]=    551 ( 0.00%,  0.16%)  [ 93]= 869426 ( 2.23%, 79.29%)  [145]=   1377 ( 0.00%, 99.92%)  [197]=    125 ( 0.00%, 99.99%)  [249]=      5 ( 0.00%,100.00%)
[ 42]=    559 ( 0.00%,  0.16%)  [ 94]= 874434 ( 2.24%, 81.53%)  [146]=   1415 ( 0.00%, 99.93%)  [198]=    123 ( 0.00%, 99.99%)  [250]=      3 ( 0.00%,100.00%)
[ 43]=    606 ( 0.00%,  0.16%)  [ 95]= 882832 ( 2.26%, 83.80%)  [147]=   1213 ( 0.00%, 99.93%)  [199]=    130 ( 0.00%,100.00%)  [251]=      3 ( 0.00%,100.00%)
[ 44]=    812 ( 0.00%,  0.16%)  [ 96]= 874243 ( 2.24%, 86.04%)  [148]=   1279 ( 0.00%, 99.93%)  [200]=    126 ( 0.00%,100.00%)  [252]=      1 ( 0.00%,100.00%)
[ 45]=   3249 ( 0.01%,  0.17%)  [ 97]= 862162 ( 2.21%, 88.25%)  [149]=   1112 ( 0.00%, 99.94%)  [201]=    118 ( 0.00%,100.00%)  [253]=      3 ( 0.00%,100.00%)
[ 46]=  32201 ( 0.08%,  0.25%)  [ 98]= 824106 ( 2.11%, 90.37%)  [150]=   1113 ( 0.00%, 99.94%)  [202]=    106 ( 0.00%,100.00%)  [254]=      1 ( 0.00%,100.00%)
[ 47]= 212418 ( 0.54%,  0.80%)  [ 99]= 711800 ( 1.83%, 92.19%)  [151]=   1100 ( 0.00%, 99.94%)  [203]=     94 ( 0.00%,100.00%)  [255]=      0 ( 0.00%,100.00%)
[ 48]= 721517 ( 1.85%,  2.65%)  [100]= 617732 ( 1.58%, 93.78%)  [152]=   1066 ( 0.00%, 99.94%)  [204]=     82 ( 0.00%,100.00%)
[ 49]=1209080 ( 3.10%,  5.75%)  [101]= 484803 ( 1.24%, 95.02%)  [153]=   1037 ( 0.00%, 99.95%)  [205]=     82 ( 0.00%,100.00%)
[ 50]=1351106 ( 3.47%,  9.22%)  [102]= 385363 ( 0.99%, 96.01%)  [154]=    962 ( 0.00%, 99.95%)  [206]=    102 ( 0.00%,100.00%)
[ 51]=1247309 ( 3.20%, 12.41%)  [103]= 277923 ( 0.71%, 96.72%)  [155]=    892 ( 0.00%, 99.95%)  [207]=     77 ( 0.00%,100.00%)
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ESA – Channel 2 (VNIR-SWIR)

```
FILE dec.2

TOTAL NUMBER OF PIXELS =    51577456
IMAGE PIXELS           =    36793042 (71.34%)
BACKGROUND PIXELS      =    14784414 (28.66%)
MINIMUM                =          27
MAXIMUM                =         244
LEFT  BOUND 2%         =          35
RIGHT BOUND 2%         =         122
MEAN                   =      77.853
VARIANCE               =     888.034
STANDARD DEVIATION     =      29.800
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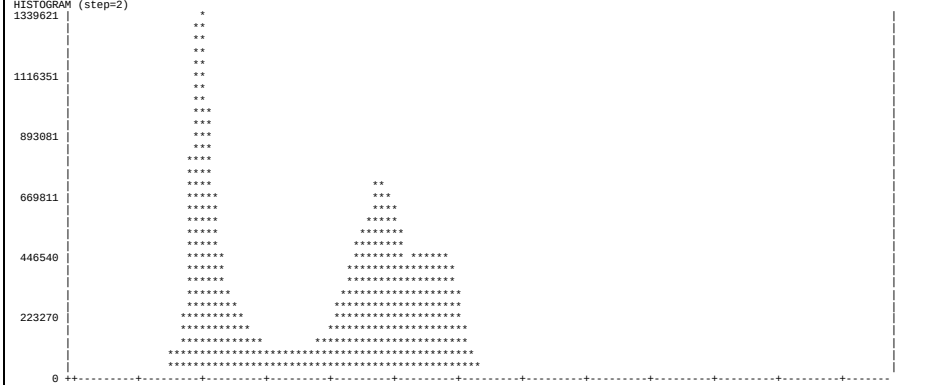
HISTOGRAM (step=2)

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[  0]=      0 ( 0.00%,  0.00%)  [ 52]= 238958 ( 0.65%, 33.86%)  [104]= 434380 ( 1.18%, 77.81%)  [156]=   1301 ( 0.00%, 99.94%)  [208]=     55 ( 0.00%,100.00%)
[  1]=      0 ( 0.00%,  0.00%)  [ 53]= 221113 ( 0.60%, 34.46%)  [105]= 420904 ( 1.14%, 78.96%)  [157]=   1175 ( 0.00%, 99.94%)  [209]=     59 ( 0.00%,100.00%)
[  2]=      0 ( 0.00%,  0.00%)  [ 54]= 213663 ( 0.58%, 35.04%)  [106]= 464791 ( 1.26%, 80.22%)  [158]=   1175 ( 0.00%, 99.95%)  [210]=     49 ( 0.00%,100.00%)
[  3]=      0 ( 0.00%,  0.00%)  [ 55]= 180419 ( 0.49%, 35.53%)  [107]= 424093 ( 1.15%, 81.37%)  [159]=   1137 ( 0.00%, 99.95%)  [211]=     43 ( 0.00%,100.00%)
[  4]=      0 ( 0.00%,  0.00%)  [ 56]= 175611 ( 0.48%, 36.01%)  [108]= 449005 ( 1.22%, 82.59%)  [160]=   1004 ( 0.00%, 99.95%)  [212]=     34 ( 0.00%,100.00%)
[  5]=      0 ( 0.00%,  0.00%)  [ 57]= 149425 ( 0.41%, 36.41%)  [109]= 419885 ( 1.14%, 83.73%)  [161]=    945 ( 0.00%, 99.96%)  [213]=     41 ( 0.00%,100.00%)
[  6]=      0 ( 0.00%,  0.00%)  [ 58]= 135503 ( 0.37%, 36.78%)  [110]= 421018 ( 1.14%, 84.88%)  [162]=    747 ( 0.00%, 99.96%)  [214]=     29 ( 0.00%,100.00%)
[  7]=      0 ( 0.00%,  0.00%)  [ 59]= 101289 ( 0.28%, 37.06%)  [111]= 452699 ( 1.23%, 86.11%)  [163]=    871 ( 0.00%, 99.96%)  [215]=     34 ( 0.00%,100.00%)
[  8]=      0 ( 0.00%,  0.00%)  [ 60]= 128793 ( 0.35%, 37.41%)  [112]= 429481 ( 1.17%, 87.28%)  [164]=    815 ( 0.00%, 99.96%)  [216]=     26 ( 0.00%,100.00%)
[  9]=      0 ( 0.00%,  0.00%)  [ 61]= 122416 ( 0.33%, 37.74%)  [113]= 467697 ( 1.27%, 88.55%)  [165]=    739 ( 0.00%, 99.97%)  [217]=     20 ( 0.00%,100.00%)
[ 10]=      0 ( 0.00%,  0.00%)  [ 62]= 116717 ( 0.32%, 38.06%)  [114]= 448723 ( 1.22%, 89.77%)  [166]=    722 ( 0.00%, 99.97%)  [218]=     18 ( 0.00%,100.00%)
[ 11]=      0 ( 0.00%,  0.00%)  [ 63]= 107495 ( 0.29%, 38.35%)  [115]= 486091 ( 1.32%, 91.09%)  [167]=    714 ( 0.00%, 99.97%)  [219]=     28 ( 0.00%,100.00%)
[ 12]=      0 ( 0.00%,  0.00%)  [ 64]= 112556 ( 0.31%, 38.65%)  [116]= 486584 ( 1.32%, 92.41%)  [168]=    626 ( 0.00%, 99.97%)  [220]=     16 ( 0.00%,100.00%)
[ 13]=      0 ( 0.00%,  0.00%)  [ 65]= 103776 ( 0.28%, 38.94%)  [117]= 477741 ( 1.30%, 93.71%)  [169]=    638 ( 0.00%, 99.97%)  [221]=     16 ( 0.00%,100.00%)
[ 14]=      0 ( 0.00%,  0.00%)  [ 66]= 103454 ( 0.28%, 39.22%)  [118]= 416378 ( 1.13%, 94.84%)  [170]=    601 ( 0.00%, 99.97%)  [222]=     13 ( 0.00%,100.00%)
[ 15]=      0 ( 0.00%,  0.00%)  [ 67]= 103738 ( 0.28%, 39.50%)  [119]= 351638 ( 0.96%, 95.80%)  [171]=    563 ( 0.00%, 99.98%)  [223]=     14 ( 0.00%,100.00%)
[ 16]=      0 ( 0.00%,  0.00%)  [ 68]=  96372 ( 0.26%, 39.76%)  [120]= 327649 ( 0.89%, 96.69%)  [172]=    498 ( 0.00%, 99.98%)  [224]=     13 ( 0.00%,100.00%)
[ 17]=      0 ( 0.00%,  0.00%)  [ 69]= 113931 ( 0.31%, 40.07%)  [121]= 281869 ( 0.77%, 97.45%)  [173]=    540 ( 0.00%, 99.98%)  [225]=     15 ( 0.00%,100.00%)
[ 18]=      0 ( 0.00%,  0.00%)  [ 70]= 114523 ( 0.31%, 40.38%)  [122]= 215926 ( 0.59%, 98.04%)  [174]=    442 ( 0.00%, 99.98%)  [226]=     17 ( 0.00%,100.00%)
[ 19]=      0 ( 0.00%,  0.00%)  [ 71]= 120232 ( 0.33%, 40.71%)  [123]= 137150 ( 0.37%, 98.41%)  [175]=    440 ( 0.00%, 99.98%)  [227]=     10 ( 0.00%,100.00%)
[ 20]=      0 ( 0.00%,  0.00%)  [ 72]= 122327 ( 0.33%, 41.04%)  [124]= 117901 ( 0.32%, 98.73%)  [176]=    454 ( 0.00%, 99.98%)  [228]=     11 ( 0.00%,100.00%)
[ 21]=      0 ( 0.00%,  0.00%)  [ 73]= 127705 ( 0.35%, 41.39%)  [125]=  93548 ( 0.25%, 98.99%)  [177]=    407 ( 0.00%, 99.98%)  [229]=      3 ( 0.00%,100.00%)
[ 22]=      0 ( 0.00%,  0.00%)  [ 74]= 125077 ( 0.34%, 41.73%)  [126]=  68662 ( 0.19%, 99.17%)  [178]=    410 ( 0.00%, 99.98%)  [230]=      7 ( 0.00%,100.00%)
[ 23]=      0 ( 0.00%,  0.00%)  [ 75]= 129458 ( 0.35%, 42.08%)  [127]=  45764 ( 0.12%, 99.30%)  [179]=    390 ( 0.00%, 99.99%)  [231]=      4 ( 0.00%,100.00%)
[ 24]=      0 ( 0.00%,  0.00%)  [ 76]= 128477 ( 0.35%, 42.43%)  [128]=  35802 ( 0.10%, 99.40%)  [180]=    324 ( 0.00%, 99.99%)  [232]=      5 ( 0.00%,100.00%)
[ 25]=      0 ( 0.00%,  0.00%)  [ 77]= 143240 ( 0.39%, 42.82%)  [129]=  30446 ( 0.08%, 99.48%)  [181]=    326 ( 0.00%, 99.99%)  [233]=      5 ( 0.00%,100.00%)
[ 26]=      0 ( 0.00%,  0.00%)  [ 78]= 164187 ( 0.45%, 43.27%)  [130]=  22911 ( 0.06%, 99.54%)  [182]=    308 ( 0.00%, 99.99%)  [234]=      1 ( 0.00%,100.00%)
[ 27]=      1 ( 0.00%,  0.00%)  [ 79]= 176315 ( 0.48%, 43.74%)  [131]=  20863 ( 0.06%, 99.60%)  [183]=    257 ( 0.00%, 99.99%)  [235]=      6 ( 0.00%,100.00%)
[ 28]=    378 ( 0.00%,  0.00%)  [ 80]= 182842 ( 0.50%, 44.24%)  [132]=  16955 ( 0.05%, 99.64%)  [184]=    286 ( 0.00%, 99.99%)  [236]=      3 ( 0.00%,100.00%)
[ 29]=  11355 ( 0.03%,  0.03%)  [ 81]= 201010 ( 0.55%, 44.79%)  [133]=  14023 ( 0.04%, 99.68%)  [185]=    272 ( 0.00%, 99.99%)  [237]=      4 ( 0.00%,100.00%)
[ 30]=  64776 ( 0.18%,  0.21%)  [ 82]= 238936 ( 0.65%, 45.44%)  [134]=  11876 ( 0.03%, 99.71%)  [186]=    230 ( 0.00%, 99.99%)  [238]=      1 ( 0.00%,100.00%)
[ 31]= 118008 ( 0.32%,  0.53%)  [ 83]= 273356 ( 0.74%, 46.18%)  [135]=  10436 ( 0.03%, 99.74%)  [187]=    241 ( 0.00%, 99.99%)  [239]=      2 ( 0.00%,100.00%)
[ 32]= 110171 ( 0.30%,  0.83%)  [ 84]= 289628 ( 0.79%, 46.97%)  [136]=   8004 ( 0.02%, 99.77%)  [188]=    215 ( 0.00%, 99.99%)  [240]=      7 ( 0.00%,100.00%)
[ 33]= 114896 ( 0.31%,  1.14%)  [ 85]= 328113 ( 0.89%, 47.86%)  [137]=   7682 ( 0.02%, 99.79%)  [189]=    214 ( 0.00%, 99.99%)  [241]=      1 ( 0.00%,100.00%)
[ 34]= 153624 ( 0.42%,  1.56%)  [ 86]= 343521 ( 0.93%, 48.79%)  [138]=   6725 ( 0.02%, 99.81%)  [190]=    202 ( 0.00%, 99.99%)  [242]=      1 ( 0.00%,100.00%)
[ 35]= 256282 ( 0.70%,  2.25%)  [ 87]= 433573 ( 1.18%, 49.97%)  [139]=   5598 ( 0.02%, 99.82%)  [191]=    193 ( 0.00%, 99.99%)  [243]=      2 ( 0.00%,100.00%)
[ 36]= 525649 ( 1.43%,  3.68%)  [ 88]= 445668 ( 1.21%, 51.18%)  [140]=   4646 ( 0.01%, 99.83%)  [192]=    174 ( 0.00%, 99.99%)  [244]=      1 ( 0.00%,100.00%)
[ 37]= 824398 ( 2.24%,  5.92%)  [ 89]= 518411 ( 1.41%, 52.59%)  [141]=   4582 ( 0.01%, 99.85%)  [193]=    161 ( 0.00%, 99.99%)  [245]=      0 ( 0.00%,100.00%)
[ 38]=1143262 ( 3.11%,  9.03%)  [ 90]= 560447 ( 1.52%, 54.11%)  [142]=   4052 ( 0.01%, 99.86%)  [194]=    164 ( 0.00%, 99.99%)  [246]=      0 ( 0.00%,100.00%)
[ 39]=1297324 ( 3.53%, 12.56%)  [ 91]= 561062 ( 1.52%, 55.64%)  [143]=   3878 ( 0.01%, 99.87%)  [195]=    127 ( 0.00%,100.00%)  [247]=      0 ( 0.00%,100.00%)
[ 40]=1339621 ( 3.64%, 16.20%)  [ 92]= 562073 ( 1.53%, 57.17%)  [144]=   3286 ( 0.01%, 99.88%)  [196]=    132 ( 0.00%,100.00%)  [248]=      0 ( 0.00%,100.00%)
[ 41]=1072885 ( 2.92%, 19.11%)  [ 93]= 596166 ( 1.62%, 58.79%)  [145]=   2696 ( 0.01%, 99.88%)  [197]=    108 ( 0.00%,100.00%)  [249]=      0 ( 0.00%,100.00%)
[ 42]=1011468 ( 2.75%, 21.86%)  [ 94]= 716585 ( 1.95%, 60.74%)  [146]=   2890 ( 0.01%, 99.89%)  [198]=    108 ( 0.00%,100.00%)  [250]=      0 ( 0.00%,100.00%)
[ 43]= 757490 ( 2.06%, 23.92%)  [ 95]= 702487 ( 1.91%, 62.64%)  [147]=   2625 ( 0.01%, 99.90%)  [199]=     91 ( 0.00%,100.00%)  [251]=      0 ( 0.00%,100.00%)
[ 44]= 685143 ( 1.86%, 25.78%)  [ 96]= 715078 ( 1.94%, 64.59%)  [148]=   2093 ( 0.01%, 99.90%)  [200]=    115 ( 0.00%,100.00%)  [252]=      0 ( 0.00%,100.00%)
[ 45]= 590625 ( 1.61%, 27.39%)  [ 97]= 715579 ( 1.94%, 66.53%)  [149]=   2343 ( 0.01%, 99.91%)  [201]=    109 ( 0.00%,100.00%)  [253]=      0 ( 0.00%,100.00%)
[ 46]= 472775 ( 1.28%, 28.67%)  [ 98]= 688131 ( 1.87%, 68.40%)  [150]=   1896 ( 0.01%, 99.92%)  [202]=     88 ( 0.00%,100.00%)  [254]=      0 ( 0.00%,100.00%)
[ 47]= 409686 ( 1.11%, 29.79%)  [ 99]= 700195 ( 1.90%, 70.31%)  [151]=   1843 ( 0.01%, 99.92%)  [203]=     86 ( 0.00%,100.00%)  [255]=      0 ( 0.00%,100.00%)
[ 48]= 351789 ( 0.96%, 30.74%)  [100]= 645290 ( 1.75%, 72.06%)  [152]=   1716 ( 0.00%, 99.93%)  [204]=     59 ( 0.00%,100.00%)
[ 49]= 331957 ( 0.90%, 31.65%)  [101]= 602481 ( 1.64%, 73.70%)  [153]=   1722 ( 0.00%, 99.93%)  [205]=     59 ( 0.00%,100.00%)
[ 50]= 298395 ( 0.81%, 32.46%)  [102]= 556527 ( 1.51%, 75.21%)  [154]=   1599 ( 0.00%, 99.93%)  [206]=     70 ( 0.00%,100.00%)
[ 51]= 276257 ( 0.75%, 33.21%)  [103]= 523187 ( 1.42%, 76.63%)  [155]=   1383 ( 0.00%, 99.94%)  [207]=     74 ( 0.00%,100.00%)
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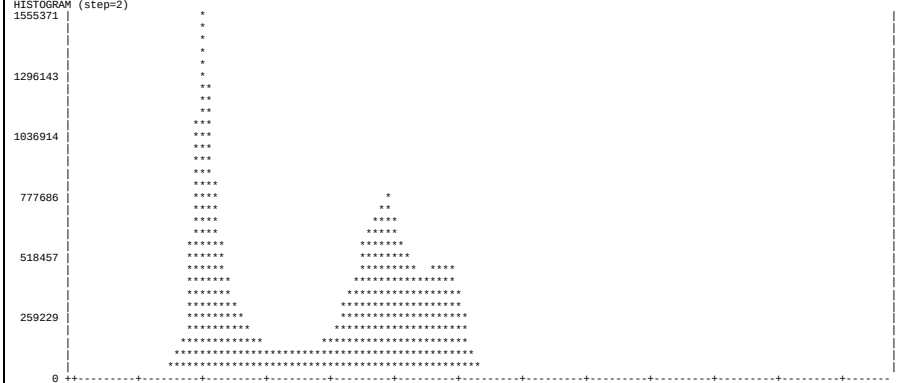
USGS – Channel 2 (VNIR-SWIR)

```
FILE dec.2

TOTAL NUMBER OF PIXELS =    58911381
IMAGE PIXELS           =    38980907 (66.17%)
BACKGROUND PIXELS      =    19930474 (33.83%)
MINIMUM                =           4
MAXIMUM                =         242
LEFT  BOUND 2%         =          36
RIGHT BOUND 2%         =         123
MEAN                   =      78.104
VARIANCE               =     895.894
STANDARD DEVIATION     =      29.931
```

HISTOGRAM (step=2)




```
[  0]=      0 ( 0.00%,  0.00%)  [ 52]= 278613 ( 0.71%, 34.35%)  [104]= 534890 ( 1.37%, 76.94%)  [156]=   1328 ( 0.00%, 99.94%)  [208]=     64 ( 0.00%,100.00%)
[  1]=      0 ( 0.00%,  0.00%)  [ 53]= 255440 ( 0.66%, 35.01%)  [105]= 514264 ( 1.32%, 78.26%)  [157]=   1210 ( 0.00%, 99.95%)  [209]=     46 ( 0.00%,100.00%)
[  2]=      0 ( 0.00%,  0.00%)  [ 54]= 218280 ( 0.56%, 35.57%)  [106]= 493204 ( 1.27%, 79.53%)  [158]=   1118 ( 0.00%, 99.95%)  [210]=     55 ( 0.00%,100.00%)
[  3]=      0 ( 0.00%,  0.00%)  [ 55]= 205281 ( 0.53%, 36.09%)  [107]= 477227 ( 1.22%, 80.75%)  [159]=   1075 ( 0.00%, 99.95%)  [211]=     41 ( 0.00%,100.00%)
[  4]=      4 ( 0.00%,  0.00%)  [ 56]= 193189 ( 0.50%, 36.59%)  [108]= 460206 ( 1.18%, 81.93%)  [160]=   1008 ( 0.00%, 99.96%)  [212]=     27 ( 0.00%,100.00%)
[  5]=    704 ( 0.00%,  0.00%)  [ 57]= 176255 ( 0.45%, 37.04%)  [109]= 452207 ( 1.16%, 83.09%)  [161]=   1025 ( 0.00%, 99.96%)  [213]=     36 ( 0.00%,100.00%)
[  6]=  10724 ( 0.03%,  0.03%)  [ 58]= 156223 ( 0.40%, 37.44%)  [110]= 462358 ( 1.19%, 84.28%)  [162]=    968 ( 0.00%, 99.96%)  [214]=     39 ( 0.00%,100.00%)
[  7]=  13513 ( 0.03%,  0.06%)  [ 59]= 143558 ( 0.37%, 37.81%)  [111]= 445638 ( 1.14%, 85.42%)  [163]=    902 ( 0.00%, 99.96%)  [215]=     25 ( 0.00%,100.00%)
[  8]=   4137 ( 0.01%,  0.07%)  [ 60]= 134294 ( 0.34%, 38.15%)  [112]= 463201 ( 1.19%, 86.61%)  [164]=    808 ( 0.00%, 99.96%)  [216]=     28 ( 0.00%,100.00%)
[  9]=   1368 ( 0.00%,  0.08%)  [ 61]= 126348 ( 0.32%, 38.48%)  [113]= 477883 ( 1.23%, 87.84%)  [165]=    803 ( 0.00%, 99.97%)  [217]=     26 ( 0.00%,100.00%)
[ 10]=    819 ( 0.00%,  0.08%)  [ 62]= 118162 ( 0.30%, 38.78%)  [114]= 476717 ( 1.22%, 89.06%)  [166]=    705 ( 0.00%, 99.97%)  [218]=     20 ( 0.00%,100.00%)
[ 11]=    650 ( 0.00%,  0.08%)  [ 63]= 109855 ( 0.28%, 39.06%)  [115]= 441822 ( 1.13%, 90.19%)  [167]=    704 ( 0.00%, 99.97%)  [219]=     20 ( 0.00%,100.00%)
[ 12]=    575 ( 0.00%,  0.08%)  [ 64]= 106588 ( 0.27%, 39.34%)  [116]= 472366 ( 1.21%, 91.41%)  [168]=    693 ( 0.00%, 99.97%)  [220]=     18 ( 0.00%,100.00%)
[ 13]=    502 ( 0.00%,  0.08%)  [ 65]= 109597 ( 0.28%, 39.62%)  [117]= 504280 ( 1.29%, 92.70%)  [169]=    636 ( 0.00%, 99.97%)  [221]=     22 ( 0.00%,100.00%)
[ 14]=    512 ( 0.00%,  0.09%)  [ 66]= 111680 ( 0.29%, 39.90%)  [118]= 503508 ( 1.29%, 93.99%)  [170]=    568 ( 0.00%, 99.98%)  [222]=     13 ( 0.00%,100.00%)
[ 15]=    508 ( 0.00%,  0.09%)  [ 67]= 111629 ( 0.29%, 40.19%)  [119]= 467061 ( 1.20%, 95.19%)  [171]=    542 ( 0.00%, 99.98%)  [223]=     15 ( 0.00%,100.00%)
[ 16]=    545 ( 0.00%,  0.09%)  [ 68]= 108561 ( 0.28%, 40.47%)  [120]= 402891 ( 1.03%, 96.22%)  [172]=    547 ( 0.00%, 99.98%)  [224]=     19 ( 0.00%,100.00%)
[ 17]=    531 ( 0.00%,  0.09%)  [ 69]= 111029 ( 0.28%, 40.75%)  [121]= 329730 ( 0.85%, 97.07%)  [173]=    516 ( 0.00%, 99.98%)  [225]=     14 ( 0.00%,100.00%)
[ 18]=    523 ( 0.00%,  0.09%)  [ 70]= 112710 ( 0.29%, 41.04%)  [122]= 264714 ( 0.68%, 97.75%)  [174]=    488 ( 0.00%, 99.98%)  [226]=     10 ( 0.00%,100.00%)
[ 19]=    609 ( 0.00%,  0.09%)  [ 71]= 119383 ( 0.31%, 41.35%)  [123]= 192701 ( 0.49%, 98.24%)  [175]=    457 ( 0.00%, 99.98%)  [227]=     16 ( 0.00%,100.00%)
[ 20]=    600 ( 0.00%,  0.09%)  [ 72]= 117406 ( 0.30%, 41.65%)  [124]= 142838 ( 0.37%, 98.61%)  [176]=    408 ( 0.00%, 99.98%)  [228]=      6 ( 0.00%,100.00%)
[ 21]=    690 ( 0.00%,  0.10%)  [ 73]= 119285 ( 0.31%, 41.96%)  [125]= 104558 ( 0.27%, 98.88%)  [177]=    389 ( 0.00%, 99.98%)  [229]=      3 ( 0.00%,100.00%)
[ 22]=    651 ( 0.00%,  0.10%)  [ 74]= 126514 ( 0.32%, 42.28%)  [126]=  78753 ( 0.20%, 99.08%)  [178]=    405 ( 0.00%, 99.98%)  [230]=      7 ( 0.00%,100.00%)
[ 23]=    667 ( 0.00%,  0.10%)  [ 75]= 132129 ( 0.34%, 42.62%)  [127]=  63244 ( 0.16%, 99.24%)  [179]=    363 ( 0.00%, 99.99%)  [231]=      4 ( 0.00%,100.00%)
[ 24]=    695 ( 0.00%,  0.10%)  [ 76]= 142765 ( 0.37%, 42.99%)  [128]=  49512 ( 0.13%, 99.37%)  [180]=    326 ( 0.00%, 99.99%)  [232]=      3 ( 0.00%,100.00%)
[ 25]=    697 ( 0.00%,  0.10%)  [ 77]= 145187 ( 0.37%, 43.36%)  [129]=  38923 ( 0.10%, 99.47%)  [181]=    339 ( 0.00%, 99.99%)  [233]=      7 ( 0.00%,100.00%)
[ 26]=    665 ( 0.00%,  0.10%)  [ 78]= 149824 ( 0.38%, 43.74%)  [130]=  29999 ( 0.08%, 99.54%)  [182]=    335 ( 0.00%, 99.99%)  [234]=      3 ( 0.00%,100.00%)
[ 27]=    649 ( 0.00%,  0.11%)  [ 79]= 161348 ( 0.41%, 44.16%)  [131]=  23140 ( 0.06%, 99.60%)  [183]=    301 ( 0.00%, 99.99%)  [235]=      1 ( 0.00%,100.00%)
[ 28]=    635 ( 0.00%,  0.11%)  [ 80]= 171775 ( 0.44%, 44.60%)  [132]=  17801 ( 0.05%, 99.65%)  [184]=    270 ( 0.00%, 99.99%)  [236]=      8 ( 0.00%,100.00%)
[ 29]=   1424 ( 0.00%,  0.11%)  [ 81]= 195059 ( 0.50%, 45.10%)  [133]=  14318 ( 0.04%, 99.69%)  [185]=    278 ( 0.00%, 99.99%)  [237]=      6 ( 0.00%,100.00%)
[ 30]=  19254 ( 0.05%,  0.16%)  [ 82]= 221988 ( 0.57%, 45.67%)  [134]=  12414 ( 0.03%, 99.72%)  [186]=    252 ( 0.00%, 99.99%)  [238]=      4 ( 0.00%,100.00%)
[ 31]=  84692 ( 0.22%,  0.38%)  [ 83]= 249593 ( 0.64%, 46.31%)  [135]=  10345 ( 0.03%, 99.74%)  [187]=    228 ( 0.00%, 99.99%)  [239]=      0 ( 0.00%,100.00%)
[ 32]= 116476 ( 0.30%,  0.68%)  [ 84]= 275029 ( 0.71%, 47.01%)  [136]=   8711 ( 0.02%, 99.77%)  [188]=    223 ( 0.00%, 99.99%)  [240]=      2 ( 0.00%,100.00%)
[ 33]= 113891 ( 0.29%,  0.97%)  [ 85]= 320659 ( 0.82%, 47.84%)  [137]=   7806 ( 0.02%, 99.79%)  [189]=    238 ( 0.00%, 99.99%)  [241]=      4 ( 0.00%,100.00%)
[ 34]= 117331 ( 0.30%,  1.27%)  [ 86]= 364473 ( 0.94%, 48.77%)  [138]=   7099 ( 0.02%, 99.81%)  [190]=    202 ( 0.00%, 99.99%)  [242]=      3 ( 0.00%,100.00%)
[ 35]= 167541 ( 0.43%,  1.70%)  [ 87]= 397661 ( 1.02%, 49.79%)  [139]=   6307 ( 0.02%, 99.82%)  [191]=    168 ( 0.00%, 99.99%)  [243]=      0 ( 0.00%,100.00%)
[ 36]= 332047 ( 0.85%,  2.55%)  [ 88]= 439609 ( 1.13%, 50.92%)  [140]=   5496 ( 0.01%, 99.84%)  [192]=    168 ( 0.00%, 99.99%)  [244]=      0 ( 0.00%,100.00%)
[ 37]= 590828 ( 1.52%,  4.07%)  [ 89]= 461575 ( 1.18%, 52.10%)  [141]=   5106 ( 0.01%, 99.85%)  [193]=    175 ( 0.00%, 99.99%)  [245]=      0 ( 0.00%,100.00%)
[ 38]= 845250 ( 2.17%,  6.23%)  [ 90]= 510751 ( 1.31%, 53.41%)  [142]=   4400 ( 0.01%, 99.86%)  [194]=    148 ( 0.00%,100.00%)  [246]=      0 ( 0.00%,100.00%)
[ 39]=1134553 ( 2.91%,  9.14%)  [ 91]= 580838 ( 1.49%, 54.90%)  [143]=   4060 ( 0.01%, 99.87%)  [195]=    152 ( 0.00%,100.00%)  [247]=      0 ( 0.00%,100.00%)
[ 40]=1484375 ( 3.81%, 12.95%)  [ 92]= 618641 ( 1.59%, 56.49%)  [144]=   3489 ( 0.01%, 99.88%)  [196]=    114 ( 0.00%,100.00%)  [248]=      0 ( 0.00%,100.00%)
[ 41]=1555371 ( 3.99%, 16.94%)  [ 93]= 646177 ( 1.66%, 58.15%)  [145]=   3228 ( 0.01%, 99.89%)  [197]=    130 ( 0.00%,100.00%)  [249]=      0 ( 0.00%,100.00%)
[ 42]=1295274 ( 3.32%, 20.27%)  [ 94]= 643586 ( 1.65%, 59.80%)  [146]=   2892 ( 0.01%, 99.90%)  [198]=    106 ( 0.00%,100.00%)  [250]=      0 ( 0.00%,100.00%)
[ 43]=1056913 ( 2.71%, 22.98%)  [ 95]= 679811 ( 1.74%, 61.54%)  [147]=   2442 ( 0.01%, 99.90%)  [199]=    130 ( 0.00%,100.00%)  [251]=      0 ( 0.00%,100.00%)
[ 44]= 869134 ( 2.23%, 25.21%)  [ 96]= 722272 ( 1.85%, 63.40%)  [148]=   2393 ( 0.01%, 99.91%)  [200]=    103 ( 0.00%,100.00%)  [252]=      0 ( 0.00%,100.00%)
[ 45]= 727739 ( 1.87%, 27.07%)  [ 97]= 751746 ( 1.93%, 65.32%)  [149]=   2271 ( 0.01%, 99.91%)  [201]=    104 ( 0.00%,100.00%)  [253]=      0 ( 0.00%,100.00%)
[ 46]= 615595 ( 1.58%, 28.65%)  [ 98]= 781177 ( 2.00%, 67.33%)  [150]=   2119 ( 0.01%, 99.92%)  [202]=     97 ( 0.00%,100.00%)  [254]=      0 ( 0.00%,100.00%)
[ 47]= 509360 ( 1.31%, 29.96%)  [ 99]= 748195 ( 1.92%, 69.25%)  [151]=   1930 ( 0.00%, 99.92%)  [203]=     91 ( 0.00%,100.00%)  [255]=      0 ( 0.00%,100.00%)
[ 48]= 443251 ( 1.14%, 31.10%)  [100]= 689534 ( 1.77%, 71.02%)  [152]=   1777 ( 0.00%, 99.93%)  [204]=     60 ( 0.00%,100.00%)
[ 49]= 374407 ( 0.96%, 32.06%)  [101]= 643670 ( 1.65%, 72.67%)  [153]=   1740 ( 0.00%, 99.93%)  [205]=     60 ( 0.00%,100.00%)
[ 50]= 332766 ( 0.85%, 32.91%)  [102]= 584705 ( 1.50%, 74.17%)  [154]=   1554 ( 0.00%, 99.94%)  [206]=     78 ( 0.00%,100.00%)
[ 51]= 282642 ( 0.73%, 33.64%)  [103]= 547608 ( 1.40%, 75.57%)  [155]=   1409 ( 0.00%, 99.94%)  [207]=     63 ( 0.00%,100.00%)
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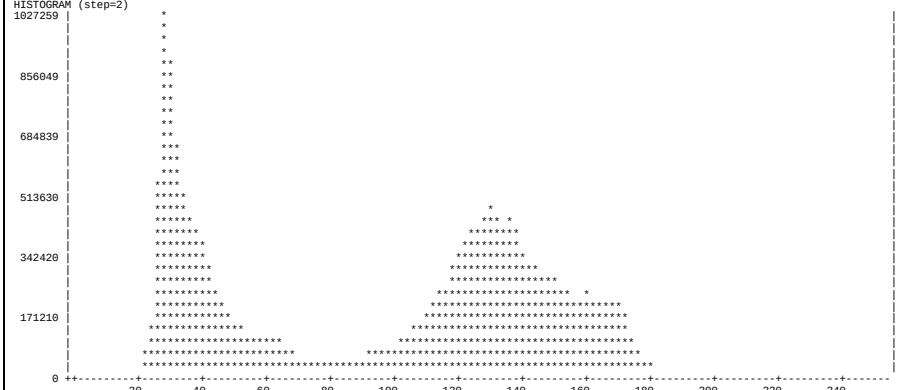
ESA – Channel 3 (VNIR-SWIR)

```
FILE dec.3

TOTAL NUMBER OF PIXELS =    51577456
IMAGE PIXELS           =    36793291 (71.34%)
BACKGROUND PIXELS      =    14784165 (28.66%)
MINIMUM                =          19
MAXIMUM                =         255
LEFT  BOUND 2%         =          27
RIGHT BOUND 2%         =         173
MEAN                   =      98.100
VARIANCE               =    2543.290
STANDARD DEVIATION     =      50.431
```

HISTOGRAM (step=2)

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[  0]=      0 ( 0.00%,  0.00%)  [ 52]= 139884 ( 0.38%, 32.44%)  [104]= 112994 ( 0.31%, 44.12%)  [156]= 236377 ( 0.64%, 88.27%)  [208]=    715 ( 0.00%, 99.97%)
[  1]=      0 ( 0.00%,  0.00%)  [ 53]= 125571 ( 0.34%, 32.78%)  [105]= 112644 ( 0.31%, 44.42%)  [157]= 201956 ( 0.55%, 88.82%)  [209]=    654 ( 0.00%, 99.97%)
[  2]=      0 ( 0.00%,  0.00%)  [ 54]= 113959 ( 0.31%, 33.09%)  [106]= 121625 ( 0.33%, 44.75%)  [158]= 215728 ( 0.59%, 89.41%)  [210]=    667 ( 0.00%, 99.97%)
[  3]=      0 ( 0.00%,  0.00%)  [ 55]= 127401 ( 0.35%, 33.44%)  [107]= 139002 ( 0.38%, 45.13%)  [159]= 227178 ( 0.62%, 90.03%)  [211]=    688 ( 0.00%, 99.97%)
[  4]=      0 ( 0.00%,  0.00%)  [ 56]= 120022 ( 0.33%, 33.77%)  [108]= 143344 ( 0.39%, 45.52%)  [160]= 239790 ( 0.65%, 90.68%)  [212]=    638 ( 0.00%, 99.97%)
[  5]=      0 ( 0.00%,  0.00%)  [ 57]= 127734 ( 0.35%, 34.11%)  [109]= 153796 ( 0.42%, 45.94%)  [161]= 236205 ( 0.64%, 91.32%)  [213]=    547 ( 0.00%, 99.97%)
[  6]=      0 ( 0.00%,  0.00%)  [ 58]= 129337 ( 0.35%, 34.47%)  [110]= 167470 ( 0.46%, 46.39%)  [162]= 234237 ( 0.64%, 91.96%)  [214]=    515 ( 0.00%, 99.98%)
[  7]=      0 ( 0.00%,  0.00%)  [ 59]= 122068 ( 0.33%, 34.80%)  [111]= 178869 ( 0.49%, 46.88%)  [163]= 232567 ( 0.63%, 92.59%)  [215]=    494 ( 0.00%, 99.98%)
[  8]=      0 ( 0.00%,  0.00%)  [ 60]= 113768 ( 0.31%, 35.11%)  [112]= 208936 ( 0.57%, 47.45%)  [164]= 234458 ( 0.64%, 93.23%)  [216]=    466 ( 0.00%, 99.98%)
[  9]=      0 ( 0.00%,  0.00%)  [ 61]= 127848 ( 0.35%, 35.45%)  [113]= 213328 ( 0.58%, 48.03%)  [165]= 235137 ( 0.64%, 93.86%)  [217]=    473 ( 0.00%, 99.98%)
[ 10]=      0 ( 0.00%,  0.00%)  [ 62]= 122089 ( 0.33%, 35.79%)  [114]= 228301 ( 0.62%, 48.65%)  [166]= 206739 ( 0.56%, 94.43%)  [218]=    390 ( 0.00%, 99.98%)
[ 11]=      0 ( 0.00%,  0.00%)  [ 63]= 115447 ( 0.31%, 36.10%)  [115]= 260232 ( 0.71%, 49.35%)  [167]= 204813 ( 0.56%, 94.98%)  [219]=    406 ( 0.00%, 99.98%)
[ 12]=      0 ( 0.00%,  0.00%)  [ 64]= 107782 ( 0.29%, 36.39%)  [116]= 224943 ( 0.61%, 49.97%)  [168]= 231261 ( 0.63%, 95.61%)  [220]=    378 ( 0.00%, 99.98%)
[ 13]=      0 ( 0.00%,  0.00%)  [ 65]=  88284 ( 0.24%, 36.63%)  [117]= 271063 ( 0.74%, 50.70%)  [169]= 222577 ( 0.60%, 96.22%)  [221]=    356 ( 0.00%, 99.98%)
[ 14]=      0 ( 0.00%,  0.00%)  [ 66]=  93742 ( 0.25%, 36.89%)  [118]= 303479 ( 0.82%, 51.53%)  [170]= 210262 ( 0.57%, 96.79%)  [222]=    318 ( 0.00%, 99.99%)
[ 15]=      0 ( 0.00%,  0.00%)  [ 67]=  84946 ( 0.23%, 37.12%)  [119]= 317710 ( 0.86%, 52.39%)  [171]= 193828 ( 0.53%, 97.32%)  [223]=    321 ( 0.00%, 99.99%)
[ 16]=      0 ( 0.00%,  0.00%)  [ 68]=  79980 ( 0.22%, 37.34%)  [120]= 312966 ( 0.85%, 53.24%)  [172]= 172351 ( 0.47%, 97.78%)  [224]=    317 ( 0.00%, 99.99%)
[ 17]=      0 ( 0.00%,  0.00%)  [ 69]=  65728 ( 0.18%, 37.51%)  [121]= 349705 ( 0.95%, 54.19%)  [173]= 149905 ( 0.41%, 98.19%)  [225]=    321 ( 0.00%, 99.99%)
[ 18]=      0 ( 0.00%,  0.00%)  [ 70]=  66918 ( 0.18%, 37.70%)  [122]= 365377 ( 0.99%, 55.19%)  [174]= 119231 ( 0.32%, 98.52%)  [226]=    285 ( 0.00%, 99.99%)
[ 19]=      1 ( 0.00%,  0.00%)  [ 71]=  67786 ( 0.18%, 37.88%)  [123]= 382382 ( 1.04%, 56.22%)  [175]= 108060 ( 0.29%, 98.81%)  [227]=    256 ( 0.00%, 99.99%)
[ 20]=    110 ( 0.00%,  0.00%)  [ 72]=  64316 ( 0.17%, 38.05%)  [124]= 374056 ( 1.02%, 57.24%)  [176]=  82336 ( 0.22%, 99.03%)  [228]=    251 ( 0.00%, 99.99%)
[ 21]=   2726 ( 0.01%,  0.01%)  [ 73]=  58681 ( 0.16%, 38.21%)  [125]= 416427 ( 1.13%, 58.37%)  [177]=  69876 ( 0.19%, 99.22%)  [229]=    215 ( 0.00%, 99.99%)
[ 22]=  24572 ( 0.07%,  0.07%)  [ 74]=  57054 ( 0.16%, 38.37%)  [126]= 433921 ( 1.18%, 59.55%)  [178]=  47774 ( 0.13%, 99.35%)  [230]=    237 ( 0.00%, 99.99%)
[ 23]=  84490 ( 0.23%,  0.30%)  [ 75]=  53119 ( 0.14%, 38.51%)  [127]= 423726 ( 1.15%, 60.70%)  [179]=  41109 ( 0.11%, 99.46%)  [231]=    186 ( 0.00%, 99.99%)
[ 24]= 119718 ( 0.33%,  0.63%)  [ 76]=  59428 ( 0.16%, 38.68%)  [128]= 464222 ( 1.26%, 61.97%)  [180]=  34462 ( 0.09%, 99.56%)  [232]=    227 ( 0.00%, 99.99%)
[ 25]= 144932 ( 0.39%,  1.02%)  [ 77]=  55709 ( 0.15%, 38.83%)  [129]= 475032 ( 1.29%, 63.26%)  [181]=  27191 ( 0.07%, 99.63%)  [233]=    179 ( 0.00%, 99.99%)
[ 26]= 261811 ( 0.71%,  1.73%)  [ 78]=  58655 ( 0.16%, 38.99%)  [130]= 484175 ( 1.32%, 64.57%)  [182]=  19001 ( 0.05%, 99.68%)  [234]=    164 ( 0.00%, 99.99%)
[ 27]= 570867 ( 1.55%,  3.29%)  [ 79]=  51035 ( 0.14%, 39.12%)  [131]= 427277 ( 1.16%, 65.73%)  [183]=  15280 ( 0.04%, 99.72%)  [235]=    196 ( 0.00%, 99.99%)
[ 28]= 817129 ( 2.22%,  5.51%)  [ 80]=  59255 ( 0.16%, 39.29%)  [132]= 455613 ( 1.24%, 66.97%)  [184]=  13187 ( 0.04%, 99.76%)  [236]=    167 ( 0.00%, 99.99%)
[ 29]=1027259 ( 2.79%,  8.30%)  [ 81]=  55802 ( 0.15%, 39.44%)  [133]= 452388 ( 1.23%, 68.20%)  [185]=  10268 ( 0.03%, 99.79%)  [237]=    145 ( 0.00%, 99.99%)
[ 30]= 917780 ( 2.49%, 10.79%)  [ 82]=  60189 ( 0.16%, 39.60%)  [134]= 414945 ( 1.13%, 69.33%)  [186]=   9584 ( 0.03%, 99.81%)  [238]=    148 ( 0.00%, 99.99%)
[ 31]= 921703 ( 2.51%, 13.30%)  [ 83]=  59808 ( 0.16%, 39.76%)  [135]= 436670 ( 1.19%, 70.52%)  [187]=   7869 ( 0.02%, 99.84%)  [239]=    124 ( 0.00%,100.00%)
[ 32]= 670113 ( 1.82%, 15.12%)  [ 84]=  61396 ( 0.17%, 39.93%)  [136]= 440948 ( 1.22%, 71.74%)  [188]=   6487 ( 0.02%, 99.85%)  [240]=    134 ( 0.00%,100.00%)
[ 33]= 651396 ( 1.77%, 16.89%)  [ 85]=  54971 ( 0.15%, 40.08%)  [137]= 378602 ( 1.03%, 72.77%)  [189]=   5517 ( 0.01%, 99.87%)  [241]=    110 ( 0.00%,100.00%)
[ 34]= 541386 ( 1.47%, 18.36%)  [ 86]=  62849 ( 0.17%, 40.25%)  [138]= 414407 ( 1.13%, 73.89%)  [190]=   4332 ( 0.01%, 99.88%)  [242]=     95 ( 0.00%,100.00%)
[ 35]= 469699 ( 1.28%, 19.64%)  [ 87]=  64305 ( 0.17%, 40.43%)  [139]= 393670 ( 1.07%, 74.96%)  [191]=   3809 ( 0.01%, 99.89%)  [243]=     92 ( 0.00%,100.00%)
[ 36]= 466315 ( 1.27%, 20.91%)  [ 88]=  61067 ( 0.17%, 40.59%)  [140]= 375856 ( 1.02%, 75.98%)  [192]=   3291 ( 0.01%, 99.90%)  [244]=    105 ( 0.00%,100.00%)
[ 37]= 413190 ( 1.12%, 22.03%)  [ 89]=  61453 ( 0.17%, 40.76%)  [141]= 337900 ( 0.92%, 76.90%)  [193]=   2898 ( 0.01%, 99.91%)  [245]=     87 ( 0.00%,100.00%)
[ 38]= 436737 ( 1.19%, 23.22%)  [ 90]=  63264 ( 0.17%, 40.93%)  [142]= 322370 ( 0.88%, 77.78%)  [194]=   2685 ( 0.01%, 99.91%)  [246]=     90 ( 0.00%,100.00%)
[ 39]= 383048 ( 1.04%, 24.26%)  [ 91]=  64696 ( 0.18%, 41.11%)  [143]= 307561 ( 0.84%, 78.61%)  [195]=   2454 ( 0.01%, 99.92%)  [247]=     95 ( 0.00%,100.00%)
[ 40]= 382161 ( 1.04%, 25.30%)  [ 92]=  71003 ( 0.19%, 41.30%)  [144]= 328363 ( 0.89%, 79.48%)  [196]=   2098 ( 0.01%, 99.93%)  [248]=     79 ( 0.00%,100.00%)
[ 41]= 349305 ( 0.95%, 26.25%)  [ 93]=  72864 ( 0.20%, 41.50%)  [145]= 308560 ( 0.84%, 80.32%)  [197]=   1954 ( 0.01%, 99.93%)  [249]=     73 ( 0.00%,100.00%)
[ 42]= 321642 ( 0.87%, 27.12%)  [ 94]=  69875 ( 0.19%, 41.69%)  [146]= 262881 ( 0.71%, 81.04%)  [198]=   1446 ( 0.00%, 99.94%)  [250]=     78 ( 0.00%,100.00%)
[ 43]= 290494 ( 0.79%, 27.91%)  [ 95]=  67762 ( 0.18%, 41.87%)  [147]= 291433 ( 0.79%, 81.83%)  [199]=   1570 ( 0.00%, 99.94%)  [251]=     64 ( 0.00%,100.00%)
[ 44]= 263275 ( 0.72%, 28.63%)  [ 96]=  78573 ( 0.21%, 42.08%)  [148]= 285309 ( 0.78%, 82.60%)  [200]=   1277 ( 0.00%, 99.94%)  [252]=     53 ( 0.00%,100.00%)
[ 45]= 238230 ( 0.65%, 29.27%)  [ 97]=  75497 ( 0.21%, 42.29%)  [149]= 279660 ( 0.76%, 83.37%)  [201]=   1353 ( 0.00%, 99.95%)  [253]=     59 ( 0.00%,100.00%)
[ 46]= 217102 ( 0.59%, 29.86%)  [ 98]=  83869 ( 0.23%, 42.52%)  [150]= 275958 ( 0.75%, 84.12%)  [202]=   1263 ( 0.00%, 99.95%)  [254]=     61 ( 0.00%,100.00%)
[ 47]= 173440 ( 0.47%, 30.34%)  [ 99]=  87998 ( 0.24%, 42.76%)  [151]= 272713 ( 0.74%, 84.86%)  [203]=   1121 ( 0.00%, 99.95%)  [255]=    498 ( 0.00%,100.00%)
[ 48]= 183462 ( 0.50%, 30.83%)  [100]=  90586 ( 0.25%, 43.00%)  [152]= 252978 ( 0.69%, 85.54%)  [204]=    976 ( 0.00%, 99.96%)
[ 49]= 169176 ( 0.46%, 31.29%)  [101]=  95974 ( 0.26%, 43.26%)  [153]= 265440 ( 0.72%, 86.27%)  [205]=    927 ( 0.00%, 99.96%)
[ 50]= 144662 ( 0.39%, 31.69%)  [102]=  93644 ( 0.25%, 43.52%)  [154]= 246858 ( 0.67%, 86.94%)  [206]=    864 ( 0.00%, 99.96%)
[ 51]= 138108 ( 0.38%, 32.06%)  [103]= 106582 ( 0.29%, 43.81%)  [155]= 255662 ( 0.69%, 87.63%)  [207]=    804 ( 0.00%, 99.96%)
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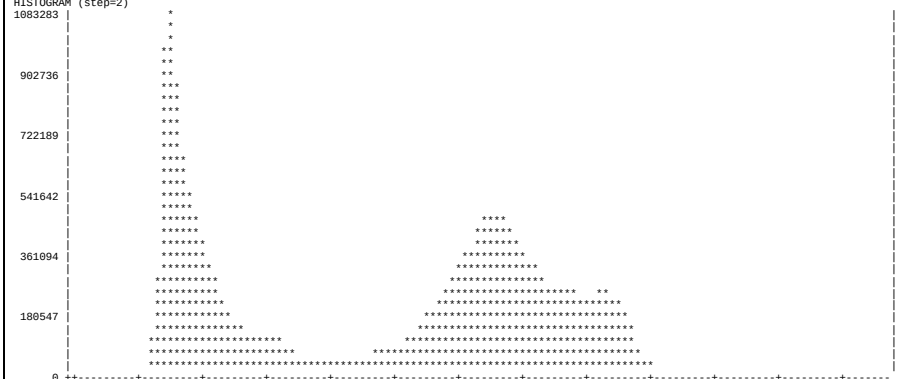
USGS – Channel 3 (VNIR-SWIR)

```
FILE dec.3

TOTAL NUMBER OF PIXELS =    58911381
IMAGE PIXELS           =    38980620 (66.17%)
BACKGROUND PIXELS      =    19930761 (33.83%)
MINIMUM                =           4
MAXIMUM                =         255
LEFT  BOUND 2%         =          28
RIGHT BOUND 2%         =         174
MEAN                   =      98.300
VARIANCE               =    2577.939
STANDARD DEVIATION     =      50.773
```

HISTOGRAM (step=2)



[0]=	0 (0.00%, 0.00%)	[52]=	154281 (0.40%, 32.94%)	[104]=	107397 (0.28%, 44.44%)	[156]=	258509 (0.66%, 87.35%)	[208]=	777 (0.00%, 99.97%)
[1]=	0 (0.00%, 0.00%)	[53]=	145094 (0.37%, 33.31%)	[105]=	112530 (0.29%, 44.73%)	[157]=	256941 (0.66%, 88.00%)	[209]=	670 (0.00%, 99.97%)
[2]=	0 (0.00%, 0.00%)	[54]=	139751 (0.36%, 33.67%)	[106]=	120320 (0.31%, 45.03%)	[158]=	252544 (0.65%, 88.65%)	[210]=	658 (0.00%, 99.97%)
[3]=	0 (0.00%, 0.00%)	[55]=	134893 (0.35%, 34.01%)	[107]=	131015 (0.34%, 45.37%)	[159]=	248849 (0.64%, 89.29%)	[211]=	602 (0.00%, 99.97%)
[4]=	25 (0.00%, 0.00%)	[56]=	130933 (0.34%, 34.35%)	[108]=	142143 (0.36%, 45.73%)	[160]=	245919 (0.63%, 89.92%)	[212]=	634 (0.00%, 99.97%)
[5]=	676 (0.00%, 0.00%)	[57]=	131244 (0.34%, 34.69%)	[109]=	153628 (0.39%, 46.13%)	[161]=	241339 (0.62%, 90.54%)	[213]=	577 (0.00%, 99.98%)
[6]=	3738 (0.01%, 0.01%)	[58]=	128981 (0.33%, 35.02%)	[110]=	166581 (0.43%, 46.56%)	[162]=	240536 (0.62%, 91.16%)	[214]=	480 (0.00%, 99.98%)
[7]=	7157 (0.02%, 0.03%)	[59]=	130902 (0.34%, 35.35%)	[111]=	183162 (0.47%, 47.03%)	[163]=	245617 (0.63%, 91.79%)	[215]=	514 (0.00%, 99.98%)
[8]=	5814 (0.01%, 0.04%)	[60]=	130610 (0.34%, 35.69%)	[112]=	195513 (0.50%, 47.53%)	[164]=	257155 (0.66%, 92.45%)	[216]=	443 (0.00%, 99.98%)
[9]=	2760 (0.01%, 0.05%)	[61]=	132303 (0.34%, 36.03%)	[113]=	204827 (0.53%, 48.05%)	[165]=	258952 (0.66%, 93.11%)	[217]=	422 (0.00%, 99.98%)
[10]=	1067 (0.00%, 0.05%)	[62]=	125628 (0.32%, 36.35%)	[114]=	222364 (0.57%, 48.62%)	[166]=	258371 (0.66%, 93.78%)	[218]=	439 (0.00%, 99.98%)
[11]=	739 (0.00%, 0.06%)	[63]=	116823 (0.30%, 36.65%)	[115]=	240066 (0.62%, 49.24%)	[167]=	249793 (0.64%, 94.42%)	[219]=	390 (0.00%, 99.98%)
[12]=	581 (0.00%, 0.06%)	[64]=	111147 (0.29%, 36.93%)	[116]=	262770 (0.67%, 49.91%)	[168]=	251330 (0.64%, 95.06%)	[220]=	372 (0.00%, 99.98%)
[13]=	523 (0.00%, 0.06%)	[65]=	106539 (0.27%, 37.21%)	[117]=	272390 (0.70%, 50.61%)	[169]=	245977 (0.63%, 95.69%)	[221]=	386 (0.00%, 99.98%)
[14]=	595 (0.00%, 0.06%)	[66]=	99664 (0.26%, 37.46%)	[118]=	286221 (0.73%, 51.35%)	[170]=	242861 (0.62%, 96.31%)	[222]=	331 (0.00%, 99.99%)
[15]=	572 (0.00%, 0.06%)	[67]=	91635 (0.24%, 37.70%)	[119]=	303451 (0.78%, 52.13%)	[171]=	230756 (0.59%, 96.91%)	[223]=	368 (0.00%, 99.99%)
[16]=	575 (0.00%, 0.06%)	[68]=	85458 (0.22%, 37.92%)	[120]=	324609 (0.83%, 52.96%)	[172]=	206550 (0.53%, 97.44%)	[224]=	292 (0.00%, 99.99%)
[17]=	552 (0.00%, 0.07%)	[69]=	75998 (0.19%, 38.11%)	[121]=	338928 (0.87%, 53.83%)	[173]=	182471 (0.47%, 97.90%)	[225]=	293 (0.00%, 99.99%)
[18]=	623 (0.00%, 0.07%)	[70]=	71108 (0.18%, 38.30%)	[122]=	360898 (0.93%, 54.75%)	[174]=	154469 (0.40%, 98.30%)	[226]=	288 (0.00%, 99.99%)
[19]=	676 (0.00%, 0.07%)	[71]=	69328 (0.18%, 38.47%)	[123]=	375681 (0.96%, 55.72%)	[175]=	129665 (0.33%, 98.63%)	[227]=	266 (0.00%, 99.99%)
[20]=	681 (0.00%, 0.07%)	[72]=	67244 (0.17%, 38.65%)	[124]=	392591 (1.01%, 56.72%)	[176]=	105231 (0.27%, 98.90%)	[228]=	234 (0.00%, 99.99%)
[21]=	834 (0.00%, 0.07%)	[73]=	63903 (0.16%, 38.81%)	[125]=	393017 (1.01%, 57.73%)	[177]=	81561 (0.21%, 99.11%)	[229]=	213 (0.00%, 99.99%)
[22]=	2915 (0.01%, 0.08%)	[74]=	63149 (0.16%, 38.97%)	[126]=	413488 (1.06%, 58.79%)	[178]=	65235 (0.17%, 99.28%)	[230]=	240 (0.00%, 99.99%)
[23]=	22672 (0.06%, 0.14%)	[75]=	61734 (0.16%, 39.13%)	[127]=	441970 (1.13%, 59.93%)	[179]=	52634 (0.14%, 99.42%)	[231]=	227 (0.00%, 99.99%)
[24]=	81592 (0.21%, 0.35%)	[76]=	61981 (0.16%, 39.29%)	[128]=	470152 (1.21%, 61.13%)	[180]=	41718 (0.11%, 99.52%)	[232]=	201 (0.00%, 99.99%)
[25]=	128677 (0.33%, 0.68%)	[77]=	60505 (0.16%, 39.44%)	[129]=	483615 (1.24%, 62.37%)	[181]=	31418 (0.08%, 99.60%)	[233]=	188 (0.00%, 99.99%)
[26]=	161293 (0.41%, 1.09%)	[78]=	60711 (0.16%, 39.60%)	[130]=	485385 (1.25%, 63.62%)	[182]=	24567 (0.06%, 99.67%)	[234]=	168 (0.00%, 99.99%)
[27]=	320863 (0.82%, 1.91%)	[79]=	60214 (0.15%, 39.75%)	[131]=	482244 (1.24%, 64.86%)	[183]=	19249 (0.05%, 99.72%)	[235]=	189 (0.00%, 99.99%)
[28]=	660008 (1.69%, 3.61%)	[80]=	60059 (0.15%, 39.91%)	[132]=	490232 (1.26%, 66.11%)	[184]=	15724 (0.04%, 99.76%)	[236]=	171 (0.00%, 99.99%)
[29]=	975111 (2.50%, 6.11%)	[81]=	59750 (0.15%, 40.06%)	[133]=	496831 (1.27%, 67.39%)	[185]=	12828 (0.03%, 99.79%)	[237]=	154 (0.00%, 99.99%)
[30]=	1083283 (2.78%, 8.89%)	[82]=	59275 (0.15%, 40.21%)	[134]=	484463 (1.24%, 68.63%)	[186]=	10294 (0.03%, 99.81%)	[238]=	139 (0.00%, 100.00%)
[31]=	1045126 (2.68%, 11.57%)	[83]=	58930 (0.15%, 40.36%)	[135]=	470715 (1.21%, 69.84%)	[187]=	8352 (0.02%, 99.84%)	[239]=	139 (0.00%, 100.00%)
[32]=	896847 (2.30%, 13.87%)	[84]=	60389 (0.15%, 40.52%)	[136]=	451912 (1.16%, 71.00%)	[188]=	6953 (0.02%, 99.85%)	[240]=	129 (0.00%, 100.00%)
[33]=	791730 (2.03%, 15.90%)	[85]=	61239 (0.16%, 40.68%)	[137]=	442226 (1.13%, 72.13%)	[189]=	5923 (0.02%, 99.87%)	[241]=	117 (0.00%, 100.00%)
[34]=	669074 (1.72%, 17.62%)	[86]=	62192 (0.16%, 40.84%)	[138]=	428727 (1.10%, 73.23%)	[190]=	5107 (0.01%, 99.88%)	[242]=	112 (0.00%, 100.00%)
[35]=	601907 (1.54%, 19.16%)	[87]=	63082 (0.16%, 41.00%)	[139]=	407255 (1.04%, 74.28%)	[191]=	4305 (0.01%, 99.89%)	[243]=	92 (0.00%, 100.00%)
[36]=	552602 (1.42%, 20.58%)	[88]=	64495 (0.17%, 41.16%)	[140]=	388143 (1.00%, 75.27%)	[192]=	3574 (0.01%, 99.90%)	[244]=	88 (0.00%, 100.00%)
[37]=	521970 (1.34%, 21.92%)	[89]=	63452 (0.16%, 41.33%)	[141]=	354148 (0.91%, 76.18%)	[193]=	3118 (0.01%, 99.91%)	[245]=	79 (0.00%, 100.00%)
[38]=	471866 (1.21%, 23.13%)	[90]=	64180 (0.16%, 41.49%)	[142]=	338278 (0.87%, 77.05%)	[194]=	2590 (0.01%, 99.92%)	[246]=	97 (0.00%, 100.00%)
[39]=	432310 (1.11%, 24.24%)	[91]=	65795 (0.17%, 41.66%)	[143]=	328486 (0.84%, 77.89%)	[195]=	2461 (0.01%, 99.92%)	[247]=	80 (0.00%, 100.00%)
[40]=	400459 (1.03%, 25.27%)	[92]=	67717 (0.17%, 41.83%)	[144]=	329491 (0.85%, 78.74%)	[196]=	2155 (0.01%, 99.93%)	[248]=	71 (0.00%, 100.00%)
[41]=	378799 (0.97%, 26.24%)	[93]=	69157 (0.18%, 42.01%)	[145]=	315807 (0.81%, 79.55%)	[197]=	2067 (0.01%, 99.93%)	[249]=	88 (0.00%, 100.00%)
[42]=	343045 (0.88%, 27.12%)	[94]=	73007 (0.19%, 42.20%)	[146]=	303965 (0.78%, 80.33%)	[198]=	1751 (0.00%, 99.94%)	[250]=	72 (0.00%, 100.00%)
[43]=	329574 (0.85%, 27.96%)	[95]=	75883 (0.19%, 42.39%)	[147]=	290697 (0.75%, 81.07%)	[199]=	1654 (0.00%, 99.94%)	[251]=	71 (0.00%, 100.00%)
[44]=	303290 (0.78%, 28.74%)	[96]=	77690 (0.20%, 42.59%)	[148]=	287979 (0.74%, 81.81%)	[200]=	1485 (0.00%, 99.95%)	[252]=	54 (0.00%, 100.00%)
[45]=	274733 (0.70%, 29.45%)	[97]=	77669 (0.20%, 42.79%)	[149]=	281376 (0.72%, 82.53%)	[201]=	1424 (0.00%, 99.95%)	[253]=	54 (0.00%, 100.00%)
[46]=	248290 (0.64%, 30.08%)	[98]=	80046 (0.21%, 43.00%)	[150]=	279687 (0.72%, 83.25%)	[202]=	1176 (0.00%, 99.95%)	[254]=	65 (0.00%, 100.00%)
[47]=	227871 (0.58%, 30.67%)	[99]=	83950 (0.22%, 43.21%)	[151]=	279601 (0.72%, 83.97%)	[203]=	1123 (0.00%, 99.96%)	[255]=	500 (0.00%, 100.00%)
[48]=	207902 (0.53%, 31.20%)	[100]=	88567 (0.23%, 43.44%)	[152]=	276124 (0.71%, 84.68%)	[204]=	1079 (0.00%, 99.96%)		
[49]=	189152 (0.49%, 31.69%)	[101]=	90522 (0.23%, 43.67%)	[153]=	263762 (0.68%, 85.35%)	[205]=	939 (0.00%, 99.96%)		
[50]=	173392 (0.44%, 32.13%)	[102]=	92627 (0.24%, 43.91%)	[154]=	260687 (0.67%, 86.02%)	[206]=	892 (0.00%, 99.96%)		
[51]=	160337 (0.41%, 32.54%)	[103]=	98260 (0.25%, 44.16%)	[155]=	257552 (0.66%, 86.68%)	[207]=	823 (0.00%, 99.97%)		

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ESA – Channel 4 (VNIR-SWIR)

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FILE dec.4

TOTAL NUMBER OF PIXELS =    51577456
IMAGE PIXELS           =    36793548 (71.34%)
BACKGROUND PIXELS      =    14783908 (28.66%)
MINIMUM                =          11
MAXIMUM                =         227
LEFT  BOUND 2%         =          18
RIGHT BOUND 2%         =         137
MEAN                   =      94.048
VARIANCE               =     852.161
STANDARD DEVIATION     =      29.192
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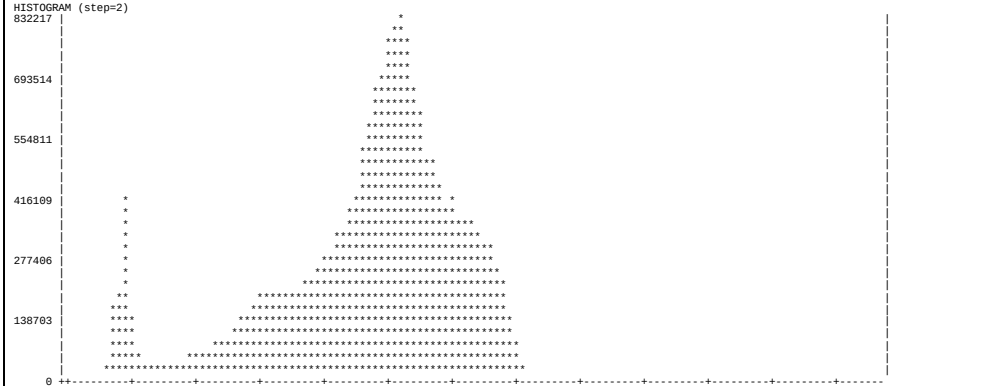
HISTOGRAM (step=2)

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[  0]=     0 ( 0.00%,  0.00%)  [ 52]=114462 ( 0.31%,  9.86%)  [104]=832217 ( 2.26%, 59.28%)  [156]=  1714 ( 0.00%, 99.96%)  [208]=     4 ( 0.00%,100.00%)
[  1]=     0 ( 0.00%,  0.00%)  [ 53]=122909 ( 0.33%, 10.20%)  [105]=815932 ( 2.22%, 61.49%)  [157]=  1380 ( 0.00%, 99.97%)  [209]=     5 ( 0.00%,100.00%)
[  2]=     0 ( 0.00%,  0.00%)  [ 54]=141346 ( 0.38%, 10.58%)  [106]=796345 ( 2.16%, 63.66%)  [158]=  1191 ( 0.00%, 99.97%)  [210]=     3 ( 0.00%,100.00%)
[  3]=     0 ( 0.00%,  0.00%)  [ 55]=152079 ( 0.41%, 11.00%)  [107]=753867 ( 2.05%, 65.71%)  [159]=   914 ( 0.00%, 99.97%)  [211]=     7 ( 0.00%,100.00%)
[  4]=     0 ( 0.00%,  0.00%)  [ 56]=153251 ( 0.42%, 11.41%)  [108]=623700 ( 1.70%, 67.40%)  [160]=  1100 ( 0.00%, 99.97%)  [212]=     4 ( 0.00%,100.00%)
[  5]=     0 ( 0.00%,  0.00%)  [ 57]=163489 ( 0.44%, 11.86%)  [109]=676044 ( 1.84%, 69.24%)  [161]=   863 ( 0.00%, 99.98%)  [213]=     2 ( 0.00%,100.00%)
[  6]=     0 ( 0.00%,  0.00%)  [ 58]=171823 ( 0.47%, 12.32%)  [110]=633529 ( 1.72%, 70.96%)  [162]=   834 ( 0.00%, 99.98%)  [214]=     1 ( 0.00%,100.00%)
[  7]=     0 ( 0.00%,  0.00%)  [ 59]=191278 ( 0.52%, 12.84%)  [111]=593753 ( 1.61%, 72.57%)  [163]=   721 ( 0.00%, 99.98%)  [215]=     2 ( 0.00%,100.00%)
[  8]=     0 ( 0.00%,  0.00%)  [ 60]=198530 ( 0.54%, 13.38%)  [112]=524750 ( 1.43%, 74.00%)  [164]=   589 ( 0.00%, 99.98%)  [216]=     2 ( 0.00%,100.00%)
[  9]=     0 ( 0.00%,  0.00%)  [ 61]=190515 ( 0.52%, 13.90%)  [113]=495088 ( 1.35%, 75.35%)  [165]=   528 ( 0.00%, 99.98%)  [217]=     1 ( 0.00%,100.00%)
[ 10]=     0 ( 0.00%,  0.00%)  [ 62]=178934 ( 0.48%, 14.38%)  [114]=503312 ( 1.37%, 76.71%)  [166]=   513 ( 0.00%, 99.99%)  [218]=     0 ( 0.00%,100.00%)
[ 11]=     4 ( 0.00%,  0.00%)  [ 63]=208558 ( 0.57%, 14.95%)  [115]=448745 ( 1.22%, 77.93%)  [167]=   471 ( 0.00%, 99.99%)  [219]=     1 ( 0.00%,100.00%)
[ 12]=   774 ( 0.00%,  0.00%)  [ 64]=194610 ( 0.53%, 15.48%)  [116]=406588 ( 1.11%, 79.04%)  [168]=   445 ( 0.00%, 99.99%)  [220]=     0 ( 0.00%,100.00%)
[ 13]= 38050 ( 0.10%,  0.11%)  [ 65]=194214 ( 0.53%, 16.01%)  [117]=446411 ( 1.21%, 80.25%)  [169]=   294 ( 0.00%, 99.99%)  [221]=     3 ( 0.00%,100.00%)
[ 14]=177524 ( 0.48%,  0.59%)  [ 66]=205033 ( 0.56%, 16.56%)  [118]=408968 ( 1.11%, 81.36%)  [170]=   375 ( 0.00%, 99.99%)  [222]=     0 ( 0.00%,100.00%)
[ 15]=138148 ( 0.38%,  0.96%)  [ 67]=205672 ( 0.56%, 17.12%)  [119]=377335 ( 1.03%, 82.39%)  [171]=   352 ( 0.00%, 99.99%)  [223]=     0 ( 0.00%,100.00%)
[ 16]=147025 ( 0.40%,  1.36%)  [ 68]=204204 ( 0.55%, 17.68%)  [120]=421339 ( 1.15%, 83.53%)  [172]=   292 ( 0.00%, 99.99%)  [224]=     1 ( 0.00%,100.00%)
[ 17]=218360 ( 0.59%,  1.96%)  [ 69]=203623 ( 0.55%, 18.23%)  [121]=410952 ( 1.12%, 84.65%)  [173]=   276 ( 0.00%, 99.99%)  [225]=     0 ( 0.00%,100.00%)
[ 18]=420738 ( 1.14%,  3.10%)  [ 70]=195893 ( 0.53%, 18.76%)  [122]=375624 ( 1.02%, 85.67%)  [174]=   257 ( 0.00%, 99.99%)  [226]=     1 ( 0.00%,100.00%)
[ 19]=371129 ( 1.01%,  4.11%)  [ 71]=195527 ( 0.53%, 19.30%)  [123]=367008 ( 1.00%, 86.67%)  [175]=   253 ( 0.00%, 99.99%)  [227]=     1 ( 0.00%,100.00%)
[ 20]=150716 ( 0.41%,  4.52%)  [ 72]=212043 ( 0.58%, 19.87%)  [124]=382545 ( 1.04%, 87.71%)  [176]=   196 ( 0.00%, 99.99%)  [228]=     0 ( 0.00%,100.00%)
[ 21]= 88868 ( 0.24%,  4.76%)  [ 73]=202632 ( 0.55%, 20.42%)  [125]=348230 ( 0.95%, 88.66%)  [177]=   194 ( 0.00%, 99.99%)  [229]=     0 ( 0.00%,100.00%)
[ 22]= 59877 ( 0.16%,  4.92%)  [ 74]=207739 ( 0.56%, 20.99%)  [126]=363311 ( 0.99%, 89.64%)  [178]=   184 ( 0.00%,100.00%)  [230]=     0 ( 0.00%,100.00%)
[ 23]= 42977 ( 0.12%,  5.04%)  [ 75]=228225 ( 0.62%, 21.61%)  [127]=350518 ( 0.95%, 90.60%)  [179]=   180 ( 0.00%,100.00%)  [231]=     0 ( 0.00%,100.00%)
[ 24]= 42738 ( 0.12%,  5.16%)  [ 76]=204854 ( 0.56%, 22.16%)  [128]=341598 ( 0.93%, 91.52%)  [180]=   170 ( 0.00%,100.00%)  [232]=     0 ( 0.00%,100.00%)
[ 25]= 38869 ( 0.11%,  5.26%)  [ 77]=241610 ( 0.66%, 22.82%)  [129]=293931 ( 0.80%, 92.32%)  [181]=   154 ( 0.00%,100.00%)  [233]=     0 ( 0.00%,100.00%)
[ 26]= 37142 ( 0.10%,  5.36%)  [ 78]=247898 ( 0.67%, 23.50%)  [130]=312176 ( 0.85%, 93.17%)  [182]=   136 ( 0.00%,100.00%)  [234]=     0 ( 0.00%,100.00%)
[ 27]= 35022 ( 0.10%,  5.46%)  [ 79]=259440 ( 0.71%, 24.20%)  [131]=310177 ( 0.84%, 94.01%)  [183]=   113 ( 0.00%,100.00%)  [235]=     0 ( 0.00%,100.00%)
[ 28]= 38290 ( 0.10%,  5.56%)  [ 80]=266880 ( 0.73%, 24.93%)  [132]=324904 ( 0.88%, 94.90%)  [184]=   115 ( 0.00%,100.00%)  [236]=     0 ( 0.00%,100.00%)
[ 29]= 35565 ( 0.10%,  5.66%)  [ 81]=278076 ( 0.76%, 25.68%)  [133]=317284 ( 0.86%, 95.76%)  [185]=   103 ( 0.00%,100.00%)  [237]=     0 ( 0.00%,100.00%)
[ 30]= 32596 ( 0.09%,  5.75%)  [ 82]=252470 ( 0.69%, 26.37%)  [134]=276937 ( 0.75%, 96.51%)  [186]=    97 ( 0.00%,100.00%)  [238]=     0 ( 0.00%,100.00%)
[ 31]= 36921 ( 0.10%,  5.85%)  [ 83]=281584 ( 0.77%, 27.13%)  [135]=253215 ( 0.69%, 97.20%)  [187]=    58 ( 0.00%,100.00%)  [239]=     0 ( 0.00%,100.00%)
[ 32]= 38184 ( 0.10%,  5.95%)  [ 84]=317425 ( 0.86%, 28.00%)  [136]=235979 ( 0.64%, 97.84%)  [188]=    61 ( 0.00%,100.00%)  [240]=     0 ( 0.00%,100.00%)
[ 33]= 36518 ( 0.10%,  6.05%)  [ 85]=334978 ( 0.91%, 28.91%)  [137]=182250 ( 0.50%, 98.34%)  [189]=    52 ( 0.00%,100.00%)  [241]=     0 ( 0.00%,100.00%)
[ 34]= 40388 ( 0.11%,  6.16%)  [ 86]=360185 ( 0.98%, 29.88%)  [138]=146108 ( 0.40%, 98.73%)  [190]=    56 ( 0.00%,100.00%)  [242]=     0 ( 0.00%,100.00%)
[ 35]= 39633 ( 0.11%,  6.27%)  [ 87]=354497 ( 0.96%, 30.85%)  [139]=122393 ( 0.33%, 99.07%)  [191]=    43 ( 0.00%,100.00%)  [243]=     0 ( 0.00%,100.00%)
[ 36]= 44230 ( 0.12%,  6.39%)  [ 88]=379049 ( 1.03%, 31.88%)  [140]= 90585 ( 0.25%, 99.31%)  [192]=    32 ( 0.00%,100.00%)  [244]=     0 ( 0.00%,100.00%)
[ 37]= 49058 ( 0.13%,  6.52%)  [ 89]=404280 ( 1.10%, 32.98%)  [141]= 64709 ( 0.18%, 99.49%)  [193]=    37 ( 0.00%,100.00%)  [245]=     0 ( 0.00%,100.00%)
[ 38]= 49408 ( 0.13%,  6.66%)  [ 90]=428459 ( 1.16%, 34.14%)  [142]= 40288 ( 0.11%, 99.60%)  [194]=    36 ( 0.00%,100.00%)  [246]=     0 ( 0.00%,100.00%)
[ 39]= 57715 ( 0.16%,  6.81%)  [ 91]=426184 ( 1.16%, 35.30%)  [143]= 34592 ( 0.09%, 99.69%)  [195]=    33 ( 0.00%,100.00%)  [247]=     0 ( 0.00%,100.00%)
[ 40]= 48321 ( 0.13%,  6.95%)  [ 92]=402204 ( 1.09%, 36.41%)  [144]= 23611 ( 0.06%, 99.76%)  [196]=    52 ( 0.00%,100.00%)  [248]=     0 ( 0.00%,100.00%)
[ 41]= 68508 ( 0.19%,  7.13%)  [ 93]=548082 ( 1.49%, 38.10%)  [145]= 17326 ( 0.05%, 99.80%)  [197]=    17 ( 0.00%,100.00%)  [249]=     0 ( 0.00%,100.00%)
[ 42]= 73286 ( 0.20%,  7.33%)  [ 94]=509409 ( 1.38%, 39.48%)  [146]= 13104 ( 0.04%, 99.84%)  [198]=    15 ( 0.00%,100.00%)  [250]=     0 ( 0.00%,100.00%)
[ 43]= 78140 ( 0.21%,  7.54%)  [ 95]=607593 ( 1.65%, 41.14%)  [147]=  9822 ( 0.03%, 99.87%)  [199]=    22 ( 0.00%,100.00%)  [251]=     0 ( 0.00%,100.00%)
[ 44]= 82215 ( 0.22%,  7.76%)  [ 96]=648549 ( 1.76%, 42.90%)  [148]=  8040 ( 0.02%, 99.89%)  [200]=    19 ( 0.00%,100.00%)  [252]=     0 ( 0.00%,100.00%)
[ 45]= 80518 ( 0.22%,  7.98%)  [ 97]=676498 ( 1.84%, 44.74%)  [149]=  6201 ( 0.02%, 99.91%)  [201]=    17 ( 0.00%,100.00%)  [253]=     0 ( 0.00%,100.00%)
[ 46]= 89544 ( 0.24%,  8.23%)  [ 98]=718072 ( 1.95%, 46.69%)  [150]=  5057 ( 0.01%, 99.92%)  [202]=    11 ( 0.00%,100.00%)  [254]=     0 ( 0.00%,100.00%)
[ 47]= 93967 ( 0.26%,  8.48%)  [ 99]=654488 ( 1.78%, 48.47%)  [151]=  4103 ( 0.01%, 99.93%)  [203]=     8 ( 0.00%,100.00%)  [255]=     0 ( 0.00%,100.00%)
[ 48]= 91594 ( 0.25%,  8.73%)  [100]=780859 ( 2.12%, 50.59%)  [152]=  3280 ( 0.01%, 99.94%)  [204]=    11 ( 0.00%,100.00%)
[ 49]=102337 ( 0.28%,  9.01%)  [101]=752817 ( 2.05%, 52.64%)  [153]=  2577 ( 0.01%, 99.95%)  [205]=     4 ( 0.00%,100.00%)
[ 50]=100706 ( 0.27%,  9.28%)  [102]=827806 ( 2.25%, 54.89%)  [154]=  2277 ( 0.01%, 99.95%)  [206]=     3 ( 0.00%,100.00%)
[ 51]= 99052 ( 0.27%,  9.55%)  [103]=782840 ( 2.13%, 57.01%)  [155]=  1861 ( 0.01%, 99.96%)  [207]=     7 ( 0.00%,100.00%)
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USGS – Channel 4 (VNIR-SWIR)

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FILE dec.4

TOTAL NUMBER OF PIXELS =    58911381
IMAGE PIXELS           =    38980550 (66.17%)
BACKGROUND PIXELS      =    19930831 (33.83%)
MINIMUM                =           5
MAXIMUM                =         228
LEFT  BOUND 2%         =          19
RIGHT BOUND 2%         =         138
MEAN                   =      94.965
VARIANCE               =     862.877
STANDARD DEVIATION     =      29.375
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[  0]=     0 ( 0.00%,  0.00%)  [ 52]=114227 ( 0.29%,  9.69%)  [104]=869730 ( 2.23%, 57.28%)  [156]=  1750 ( 0.00%, 99.96%)  [208]=     9 ( 0.00%,100.00%)
[  1]=     0 ( 0.00%,  0.00%)  [ 53]=117384 ( 0.30%,  9.99%)  [105]=852692 ( 2.19%, 59.47%)  [157]=  1496 ( 0.00%, 99.97%)  [209]=     4 ( 0.00%,100.00%)
[  2]=     0 ( 0.00%,  0.00%)  [ 54]=137064 ( 0.35%, 10.34%)  [106]=829112 ( 2.13%, 61.60%)  [158]=  1248 ( 0.00%, 99.97%)  [210]=     1 ( 0.00%,100.00%)
[  3]=     0 ( 0.00%,  0.00%)  [ 55]=151643 ( 0.39%, 10.73%)  [107]=740787 ( 1.90%, 63.50%)  [159]=  1193 ( 0.00%, 99.97%)  [211]=     6 ( 0.00%,100.00%)
[  4]=     0 ( 0.00%,  0.00%)  [ 56]=161022 ( 0.41%, 11.14%)  [108]=748898 ( 1.92%, 65.42%)  [160]=  1104 ( 0.00%, 99.97%)  [212]=     5 ( 0.00%,100.00%)
[  5]=     2 ( 0.00%,  0.00%)  [ 57]=175243 ( 0.45%, 11.59%)  [109]=737175 ( 1.89%, 67.31%)  [161]=   999 ( 0.00%, 99.98%)  [213]=     3 ( 0.00%,100.00%)
[  6]=   890 ( 0.00%,  0.00%)  [ 58]=183250 ( 0.47%, 12.06%)  [110]=697555 ( 1.79%, 69.10%)  [162]=   864 ( 0.00%, 99.98%)  [214]=     2 ( 0.00%,100.00%)
[  7]=  6690 ( 0.02%,  0.02%)  [ 59]=195767 ( 0.50%, 12.56%)  [111]=656032 ( 1.68%, 70.78%)  [163]=   713 ( 0.00%, 99.98%)  [215]=     4 ( 0.00%,100.00%)
[  8]=  2991 ( 0.01%,  0.03%)  [ 60]=197339 ( 0.51%, 13.07%)  [112]=614632 ( 1.58%, 72.36%)  [164]=   673 ( 0.00%, 99.98%)  [216]=     0 ( 0.00%,100.00%)
[  9]=  1278 ( 0.00%,  0.03%)  [ 61]=211251 ( 0.54%, 13.61%)  [113]=579199 ( 1.49%, 73.85%)  [165]=   566 ( 0.00%, 99.98%)  [217]=     0 ( 0.00%,100.00%)
[ 10]=   577 ( 0.00%,  0.03%)  [ 62]=211725 ( 0.54%, 14.16%)  [114]=544118 ( 1.40%, 75.24%)  [166]=   538 ( 0.00%, 99.99%)  [218]=     0 ( 0.00%,100.00%)
[ 11]=   407 ( 0.00%,  0.03%)  [ 63]=203664 ( 0.52%, 14.68%)  [115]=513883 ( 1.32%, 76.56%)  [167]=   463 ( 0.00%, 99.99%)  [219]=     1 ( 0.00%,100.00%)
[ 12]=   344 ( 0.00%,  0.03%)  [ 64]=203725 ( 0.52%, 15.20%)  [116]=484119 ( 1.24%, 77.80%)  [168]=   425 ( 0.00%, 99.99%)  [220]=     1 ( 0.00%,100.00%)
[ 13]=  2396 ( 0.01%,  0.04%)  [ 65]=216658 ( 0.56%, 15.76%)  [117]=424480 ( 1.09%, 78.89%)  [169]=   364 ( 0.00%, 99.99%)  [221]=     2 ( 0.00%,100.00%)
[ 14]= 42540 ( 0.11%,  0.15%)  [ 66]=218387 ( 0.56%, 16.32%)  [118]=436557 ( 1.12%, 80.01%)  [170]=   368 ( 0.00%, 99.99%)  [222]=     0 ( 0.00%,100.00%)
[ 15]=169457 ( 0.43%,  0.58%)  [ 67]=210652 ( 0.54%, 16.86%)  [119]=443777 ( 1.14%, 81.15%)  [171]=   370 ( 0.00%, 99.99%)  [223]=     0 ( 0.00%,100.00%)
[ 16]=143753 ( 0.37%,  0.95%)  [ 68]=211218 ( 0.54%, 17.40%)  [120]=412417 ( 1.06%, 82.21%)  [172]=   297 ( 0.00%, 99.99%)  [224]=     2 ( 0.00%,100.00%)
[ 17]=145970 ( 0.37%,  1.33%)  [ 69]=212421 ( 0.54%, 17.94%)  [121]=355970 ( 0.91%, 83.12%)  [173]=   300 ( 0.00%, 99.99%)  [225]=     0 ( 0.00%,100.00%)
[ 18]=219643 ( 0.56%,  1.89%)  [ 70]=207471 ( 0.53%, 18.48%)  [122]=392149 ( 1.01%, 84.13%)  [174]=   252 ( 0.00%, 99.99%)  [226]=     0 ( 0.00%,100.00%)
[ 19]=436310 ( 1.12%,  3.01%)  [ 71]=217432 ( 0.56%, 19.03%)  [123]=403047 ( 1.03%, 85.16%)  [175]=   256 ( 0.00%, 99.99%)  [227]=     0 ( 0.00%,100.00%)
[ 20]=424513 ( 1.09%,  4.10%)  [ 72]=219022 ( 0.56%, 19.60%)  [124]=405295 ( 1.04%, 86.20%)  [176]=   215 ( 0.00%, 99.99%)  [228]=     1 ( 0.00%,100.00%)
[ 21]=175833 ( 0.45%,  4.55%)  [ 73]=210718 ( 0.54%, 20.14%)  [125]=399740 ( 1.03%, 87.23%)  [177]=   192 ( 0.00%,100.00%)  [229]=     0 ( 0.00%,100.00%)
[ 22]= 97967 ( 0.25%,  4.80%)  [ 74]=222565 ( 0.57%, 20.71%)  [126]=389454 ( 1.00%, 88.23%)  [178]=   208 ( 0.00%,100.00%)  [230]=     0 ( 0.00%,100.00%)
[ 23]= 64224 ( 0.16%,  4.97%)  [ 75]=212408 ( 0.54%, 21.25%)  [127]=381362 ( 0.98%, 89.20%)  [179]=   193 ( 0.00%,100.00%)  [231]=     0 ( 0.00%,100.00%)
[ 24]= 51723 ( 0.13%,  5.10%)  [ 76]=212268 ( 0.54%, 21.80%)  [128]=361313 ( 0.93%, 90.13%)  [180]=   159 ( 0.00%,100.00%)  [232]=     0 ( 0.00%,100.00%)
[ 25]= 44151 ( 0.11%,  5.21%)  [ 77]=239669 ( 0.61%, 22.41%)  [129]=346527 ( 0.89%, 91.02%)  [181]=   143 ( 0.00%,100.00%)  [233]=     0 ( 0.00%,100.00%)
[ 26]= 40399 ( 0.10%,  5.32%)  [ 78]=253635 ( 0.65%, 23.06%)  [130]=362798 ( 0.93%, 91.95%)  [182]=   149 ( 0.00%,100.00%)  [234]=     0 ( 0.00%,100.00%)
[ 27]= 38926 ( 0.10%,  5.42%)  [ 79]=262210 ( 0.67%, 23.74%)  [131]=355535 ( 0.91%, 92.86%)  [183]=   116 ( 0.00%,100.00%)  [235]=     0 ( 0.00%,100.00%)
[ 28]= 39350 ( 0.10%,  5.52%)  [ 80]=272471 ( 0.70%, 24.43%)  [132]=367459 ( 0.94%, 93.80%)  [184]=   123 ( 0.00%,100.00%)  [236]=     0 ( 0.00%,100.00%)
[ 29]= 39884 ( 0.10%,  5.62%)  [ 81]=278660 ( 0.71%, 25.15%)  [133]=346282 ( 0.89%, 94.69%)  [185]=    83 ( 0.00%,100.00%)  [237]=     0 ( 0.00%,100.00%)
[ 30]= 39004 ( 0.10%,  5.72%)  [ 82]=281879 ( 0.72%, 25.87%)  [134]=355798 ( 0.91%, 95.61%)  [186]=    88 ( 0.00%,100.00%)  [238]=     0 ( 0.00%,100.00%)
[ 31]= 37858 ( 0.10%,  5.82%)  [ 83]=280063 ( 0.72%, 26.59%)  [135]=332481 ( 0.85%, 96.46%)  [187]=    78 ( 0.00%,100.00%)  [239]=     0 ( 0.00%,100.00%)
[ 32]= 39659 ( 0.10%,  5.92%)  [ 84]=297749 ( 0.76%, 27.35%)  [136]=299244 ( 0.77%, 97.23%)  [188]=    67 ( 0.00%,100.00%)  [240]=     0 ( 0.00%,100.00%)
[ 33]= 41087 ( 0.11%,  6.02%)  [ 85]=307698 ( 0.79%, 28.14%)  [137]=253048 ( 0.65%, 97.88%)  [189]=    56 ( 0.00%,100.00%)  [241]=     0 ( 0.00%,100.00%)
[ 34]= 40563 ( 0.10%,  6.13%)  [ 86]=340498 ( 0.87%, 29.02%)  [138]=204560 ( 0.52%, 98.40%)  [190]=    50 ( 0.00%,100.00%)  [242]=     0 ( 0.00%,100.00%)
[ 35]= 42342 ( 0.11%,  6.24%)  [ 87]=375172 ( 0.96%, 29.98%)  [139]=160696 ( 0.41%, 98.81%)  [191]=    42 ( 0.00%,100.00%)  [243]=     0 ( 0.00%,100.00%)
[ 36]= 42204 ( 0.11%,  6.34%)  [ 88]=401776 ( 1.03%, 31.01%)  [140]=120358 ( 0.31%, 99.12%)  [192]=    34 ( 0.00%,100.00%)  [244]=     0 ( 0.00%,100.00%)
[ 37]= 47074 ( 0.12%,  6.46%)  [ 89]=422452 ( 1.08%, 32.09%)  [141]= 91048 ( 0.23%, 99.36%)  [193]=    40 ( 0.00%,100.00%)  [245]=     0 ( 0.00%,100.00%)
[ 38]= 49501 ( 0.13%,  6.59%)  [ 90]=436905 ( 1.12%, 33.21%)  [142]= 65512 ( 0.17%, 99.52%)  [194]=    36 ( 0.00%,100.00%)  [246]=     0 ( 0.00%,100.00%)
[ 39]= 57457 ( 0.15%,  6.74%)  [ 91]=449421 ( 1.15%, 34.37%)  [143]= 42699 ( 0.11%, 99.63%)  [195]=    29 ( 0.00%,100.00%)  [247]=     0 ( 0.00%,100.00%)
[ 40]= 61730 ( 0.16%,  6.90%)  [ 92]=439862 ( 1.13%, 35.49%)  [144]= 33308 ( 0.09%, 99.72%)  [196]=    33 ( 0.00%,100.00%)  [248]=     0 ( 0.00%,100.00%)
[ 41]= 69188 ( 0.18%,  7.07%)  [ 93]=506878 ( 1.30%, 36.95%)  [145]= 23284 ( 0.06%, 99.78%)  [197]=    35 ( 0.00%,100.00%)  [249]=     0 ( 0.00%,100.00%)
[ 42]= 73866 ( 0.19%,  7.26%)  [ 94]=565926 ( 1.45%, 38.40%)  [146]= 17628 ( 0.05%, 99.82%)  [198]=    18 ( 0.00%,100.00%)  [250]=     0 ( 0.00%,100.00%)
[ 43]= 72660 ( 0.19%,  7.45%)  [ 95]=611221 ( 1.57%, 39.97%)  [147]= 13254 ( 0.03%, 99.86%)  [199]=    15 ( 0.00%,100.00%)  [251]=     0 ( 0.00%,100.00%)
[ 44]= 81995 ( 0.21%,  7.66%)  [ 96]=641506 ( 1.65%, 41.61%)  [148]= 10063 ( 0.03%, 99.88%)  [200]=    11 ( 0.00%,100.00%)  [252]=     0 ( 0.00%,100.00%)
[ 45]= 86529 ( 0.22%,  7.88%)  [ 97]=669910 ( 1.72%, 43.33%)  [149]=  7440 ( 0.02%, 99.90%)  [201]=    18 ( 0.00%,100.00%)  [253]=     0 ( 0.00%,100.00%)
[ 46]= 92132 ( 0.24%,  8.12%)  [ 98]=642888 ( 1.65%, 44.98%)  [150]=  5895 ( 0.02%, 99.92%)  [202]=    17 ( 0.00%,100.00%)  [254]=     0 ( 0.00%,100.00%)
[ 47]= 94652 ( 0.24%,  8.36%)  [ 99]=765827 ( 1.81%, 46.79%)  [151]=  4488 ( 0.01%, 99.93%)  [203]=    10 ( 0.00%,100.00%)  [255]=     0 ( 0.00%,100.00%)
[ 48]= 94101 ( 0.24%,  8.60%)  [100]=748341 ( 1.92%, 48.71%)  [152]=  3655 ( 0.01%, 99.94%)  [204]=     8 ( 0.00%,100.00%)
[ 49]= 96236 ( 0.25%,  8.85%)  [101]=815189 ( 2.09%, 50.80%)  [153]=  3072 ( 0.01%, 99.95%)  [205]=     8 ( 0.00%,100.00%)
[ 50]=103244 ( 0.26%,  9.12%)  [102]=826988 ( 2.12%, 52.92%)  [154]=  2489 ( 0.01%, 99.95%)  [206]=     3 ( 0.00%,100.00%)
[ 51]=108778 ( 0.28%,  9.39%)  [103]=830278 ( 2.13%, 55.05%)  [155]=  2001 ( 0.01%, 99.96%)  [207]=     2 ( 0.00%,100.00%)
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ESA – Channel 5 (VNIR-SWIR)

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FILE dec.5

TOTAL NUMBER OF PIXELS =    51577456
IMAGE PIXELS           =    36794502 (71.34%)
BACKGROUND PIXELS      =    14782954 (28.66%)
MINIMUM                =           7
MAXIMUM                =         255
LEFT  BOUND 2%         =          13
RIGHT BOUND 2%         =         178
MEAN                   =     103.864
VARIANCE               =    2629.586
STANDARD DEVIATION     =      51.279
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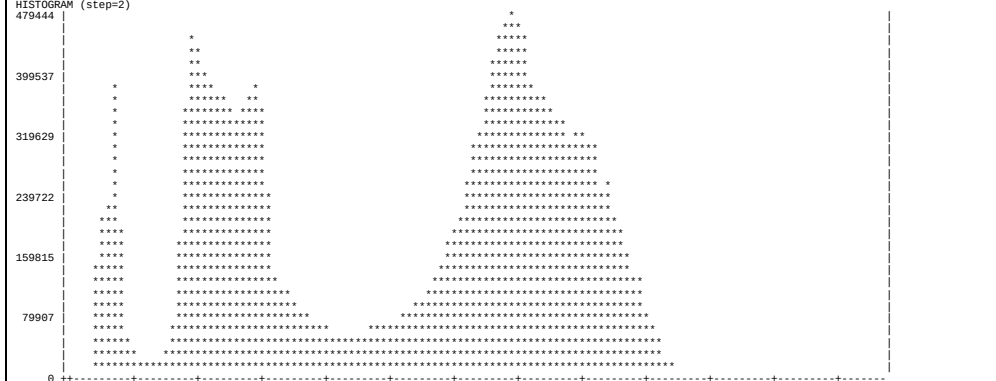
HISTOGRAM (step=2)

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[  0]=     0 ( 0.00%,  0.00%)  [ 52]=340405 ( 0.93%, 25.20%)  [104]= 81005 ( 0.22%, 43.25%)  [156]=295209 ( 0.80%, 83.66%)  [208]=   669 ( 0.00%, 99.99%)
[  1]=     0 ( 0.00%,  0.00%)  [ 53]=339526 ( 0.92%, 26.12%)  [105]= 83796 ( 0.23%, 43.47%)  [157]=311876 ( 0.85%, 84.51%)  [209]=   616 ( 0.00%, 99.99%)
[  2]=     0 ( 0.00%,  0.00%)  [ 54]=313913 ( 0.85%, 26.97%)  [106]= 87312 ( 0.24%, 43.71%)  [158]=332306 ( 0.90%, 85.41%)  [210]=   554 ( 0.00%, 99.99%)
[  3]=     0 ( 0.00%,  0.00%)  [ 55]=361339 ( 0.98%, 27.95%)  [107]= 91689 ( 0.25%, 43.96%)  [159]=306511 ( 0.83%, 86.25%)  [211]=   437 ( 0.00%, 99.99%)
[  4]=     0 ( 0.00%,  0.00%)  [ 56]=299003 ( 0.81%, 28.77%)  [108]= 89690 ( 0.24%, 44.20%)  [160]=324264 ( 0.88%, 87.13%)  [212]=   484 ( 0.00%, 99.99%)
[  5]=     0 ( 0.00%,  0.00%)  [ 57]=375688 ( 1.02%, 29.79%)  [109]= 99868 ( 0.27%, 44.48%)  [161]=300611 ( 0.82%, 87.95%)  [213]=   390 ( 0.00%, 99.99%)
[  6]=     0 ( 0.00%,  0.00%)  [ 58]=387747 ( 1.05%, 30.84%)  [110]= 99174 ( 0.27%, 44.75%)  [162]=315064 ( 0.86%, 88.80%)  [214]=   393 ( 0.00%, 99.99%)
[  7]=   231 ( 0.00%,  0.00%)  [ 59]=383768 ( 1.04%, 31.88%)  [111]= 89508 ( 0.24%, 44.99%)  [163]=306603 ( 0.83%, 89.63%)  [215]=   326 ( 0.00%, 99.99%)
[  8]= 18177 ( 0.05%,  0.05%)  [ 60]=359509 ( 0.98%, 32.86%)  [112]=116195 ( 0.32%, 45.30%)  [164]=304255 ( 0.83%, 90.46%)  [216]=   291 ( 0.00%, 99.99%)
[  9]=145471 ( 0.40%,  0.45%)  [ 61]=270045 ( 0.73%, 33.60%)  [113]=113841 ( 0.31%, 45.61%)  [165]=290750 ( 0.79%, 91.25%)  [217]=   222 ( 0.00%,100.00%)
[ 10]=211553 ( 0.57%,  1.02%)  [ 62]=244459 ( 0.66%, 34.26%)  [114]=130017 ( 0.35%, 45.97%)  [166]=248942 ( 0.68%, 91.93%)  [218]=   224 ( 0.00%,100.00%)
[ 11]=160880 ( 0.44%,  1.46%)  [ 63]=185866 ( 0.51%, 34.76%)  [115]=136219 ( 0.37%, 46.34%)  [167]=254622 ( 0.69%, 92.62%)  [219]=   201 ( 0.00%,100.00%)
[ 12]=185547 ( 0.50%,  1.96%)  [ 64]=143429 ( 0.39%, 35.15%)  [116]=145816 ( 0.40%, 46.73%)  [168]=261700 ( 0.71%, 93.33%)  [220]=   161 ( 0.00%,100.00%)
[ 13]=234081 ( 0.64%,  2.60%)  [ 65]=126794 ( 0.34%, 35.50%)  [117]=145291 ( 0.39%, 47.13%)  [169]=245617 ( 0.67%, 94.00%)  [221]=   127 ( 0.00%,100.00%)
[ 14]=358762 ( 0.98%,  3.57%)  [ 66]=125790 ( 0.34%, 35.84%)  [118]=167957 ( 0.46%, 47.59%)  [170]=185060 ( 0.50%, 94.50%)  [222]=   132 ( 0.00%,100.00%)
[ 15]=398391 ( 1.08%,  4.66%)  [ 67]=119275 ( 0.32%, 36.17%)  [119]=178705 ( 0.49%, 48.07%)  [171]=216031 ( 0.59%, 95.09%)  [223]=   114 ( 0.00%,100.00%)
[ 16]=200948 ( 0.55%,  5.20%)  [ 68]=114600 ( 0.31%, 36.48%)  [120]=156369 ( 0.42%, 48.50%)  [172]=198566 ( 0.54%, 95.63%)  [224]=    91 ( 0.00%,100.00%)
[ 17]= 90500 ( 0.25%,  5.45%)  [ 69]=108132 ( 0.29%, 36.77%)  [121]=191971 ( 0.52%, 49.02%)  [173]=184201 ( 0.50%, 96.13%)  [225]=    59 ( 0.00%,100.00%)
[ 18]= 49762 ( 0.14%,  5.58%)  [ 70]=103171 ( 0.28%, 37.05%)  [122]=204344 ( 0.56%, 49.57%)  [174]=150563 ( 0.41%, 96.54%)  [226]=    73 ( 0.00%,100.00%)
[ 19]= 41194 ( 0.11%,  5.70%)  [ 71]= 85352 ( 0.23%, 37.28%)  [123]=219619 ( 0.60%, 50.17%)  [175]=160773 ( 0.44%, 96.98%)  [227]=    46 ( 0.00%,100.00%)
[ 20]= 32341 ( 0.09%,  5.78%)  [ 72]= 93095 ( 0.25%, 37.54%)  [124]=234504 ( 0.64%, 50.81%)  [176]=142281 ( 0.39%, 97.36%)  [228]=    64 ( 0.00%,100.00%)
[ 21]= 27123 ( 0.07%,  5.86%)  [ 73]= 88215 ( 0.24%, 37.78%)  [125]=269480 ( 0.73%, 51.54%)  [177]=139657 ( 0.38%, 97.74%)  [229]=    45 ( 0.00%,100.00%)
[ 22]= 22740 ( 0.06%,  5.92%)  [ 74]= 79504 ( 0.22%, 37.99%)  [126]=269173 ( 0.73%, 52.27%)  [178]=130411 ( 0.35%, 98.10%)  [230]=    27 ( 0.00%,100.00%)
[ 23]= 21898 ( 0.06%,  5.98%)  [ 75]= 80757 ( 0.22%, 38.21%)  [127]=305423 ( 0.83%, 53.10%)  [179]=111393 ( 0.30%, 98.40%)  [231]=    46 ( 0.00%,100.00%)
[ 24]= 20997 ( 0.06%,  6.04%)  [ 76]= 76860 ( 0.21%, 38.42%)  [128]=326387 ( 0.89%, 53.99%)  [180]= 91930 ( 0.25%, 98.65%)  [232]=    36 ( 0.00%,100.00%)
[ 25]= 20778 ( 0.06%,  6.09%)  [ 77]= 69392 ( 0.19%, 38.61%)  [129]=319815 ( 0.87%, 54.86%)  [181]= 93321 ( 0.25%, 98.90%)  [233]=    25 ( 0.00%,100.00%)
[ 26]= 21881 ( 0.06%,  6.15%)  [ 78]= 66152 ( 0.18%, 38.79%)  [130]=340167 ( 0.92%, 55.78%)  [182]= 78290 ( 0.21%, 99.12%)  [234]=    32 ( 0.00%,100.00%)
[ 27]= 23676 ( 0.06%,  6.22%)  [ 79]= 55299 ( 0.15%, 38.94%)  [131]=381308 ( 1.04%, 56.82%)  [183]= 64887 ( 0.18%, 99.29%)  [235]=    14 ( 0.00%,100.00%)
[ 28]= 26953 ( 0.07%,  6.29%)  [ 80]= 61456 ( 0.17%, 39.11%)  [132]=369425 ( 1.00%, 57.82%)  [184]= 52565 ( 0.14%, 99.43%)  [236]=    24 ( 0.00%,100.00%)
[ 29]= 31646 ( 0.09%,  6.37%)  [ 81]= 64250 ( 0.17%, 39.28%)  [133]=416460 ( 1.13%, 58.95%)  [185]= 41610 ( 0.11%, 99.55%)  [237]=    16 ( 0.00%,100.00%)
[ 30]= 38916 ( 0.11%,  6.48%)  [ 82]= 61693 ( 0.17%, 39.45%)  [134]=430768 ( 1.17%, 60.13%)  [186]= 29918 ( 0.08%, 99.63%)  [238]=    12 ( 0.00%,100.00%)
[ 31]= 45871 ( 0.12%,  6.61%)  [ 83]= 60492 ( 0.16%, 39.61%)  [135]=451237 ( 1.23%, 61.35%)  [187]= 25925 ( 0.07%, 99.70%)  [239]=    16 ( 0.00%,100.00%)
[ 32]= 45284 ( 0.12%,  6.73%)  [ 84]= 55822 ( 0.15%, 39.76%)  [136]=436478 ( 1.19%, 62.54%)  [188]= 18708 ( 0.05%, 99.75%)  [240]=     9 ( 0.00%,100.00%)
[ 33]= 75556 ( 0.21%,  6.93%)  [ 85]= 59863 ( 0.16%, 39.93%)  [137]=477810 ( 1.30%, 63.84%)  [189]= 13770 ( 0.04%, 99.79%)  [241]=    12 ( 0.00%,100.00%)
[ 34]=101033 ( 0.27%,  7.21%)  [ 86]= 52123 ( 0.14%, 40.07%)  [138]=458446 ( 1.25%, 65.08%)  [190]= 12430 ( 0.03%, 99.82%)  [242]=    10 ( 0.00%,100.00%)
[ 35]=182832 ( 0.50%,  7.71%)  [ 87]= 56065 ( 0.15%, 40.22%)  [139]=479444 ( 1.30%, 66.39%)  [191]= 10249 ( 0.03%, 99.85%)  [243]=     7 ( 0.00%,100.00%)
[ 36]=267285 ( 0.73%,  8.43%)  [ 88]= 58685 ( 0.16%, 40.38%)  [140]=473917 ( 1.29%, 67.67%)  [192]=  8061 ( 0.02%, 99.87%)  [244]=     6 ( 0.00%,100.00%)
[ 37]=355580 ( 0.97%,  9.40%)  [ 89]= 59742 ( 0.16%, 40.54%)  [141]=462707 ( 1.26%, 68.93%)  [193]=  7095 ( 0.02%, 99.89%)  [245]=     6 ( 0.00%,100.00%)
[ 38]=409260 ( 1.11%, 10.51%)  [ 90]= 59872 ( 0.16%, 40.71%)  [142]=449585 ( 1.22%, 70.15%)  [194]=  5862 ( 0.02%, 99.91%)  [246]=     5 ( 0.00%,100.00%)
[ 39]=456270 ( 1.24%, 11.75%)  [ 91]= 52894 ( 0.14%, 40.85%)  [143]=437332 ( 1.19%, 71.34%)  [195]=  4856 ( 0.01%, 99.92%)  [247]=     5 ( 0.00%,100.00%)
[ 40]=444524 ( 1.21%, 12.96%)  [ 92]= 61336 ( 0.17%, 41.02%)  [144]=417153 ( 1.13%, 72.35%)  [196]=  3990 ( 0.01%, 99.93%)  [248]=     4 ( 0.00%,100.00%)
[ 41]=425237 ( 1.16%, 14.11%)  [ 93]= 58374 ( 0.16%, 41.17%)  [145]=386021 ( 1.05%, 73.40%)  [197]=  3206 ( 0.01%, 99.94%)  [249]=     8 ( 0.00%,100.00%)
[ 42]=407374 ( 1.11%, 15.22%)  [ 94]= 63750 ( 0.17%, 41.35%)  [146]=376187 ( 1.02%, 74.42%)  [198]=  2921 ( 0.01%, 99.95%)  [250]=     4 ( 0.00%,100.00%)
[ 43]=397628 ( 1.08%, 16.30%)  [ 95]= 64754 ( 0.18%, 41.52%)  [147]=335934 ( 0.91%, 75.33%)  [199]=  2480 ( 0.01%, 99.95%)  [251]=     0 ( 0.00%,100.00%)
[ 44]=390463 ( 1.06%, 17.36%)  [ 96]= 61956 ( 0.17%, 41.69%)  [148]=374745 ( 1.02%, 76.35%)  [200]=  2223 ( 0.01%, 99.96%)  [252]=     4 ( 0.00%,100.00%)
[ 45]=387956 ( 1.05%, 18.42%)  [ 97]= 67403 ( 0.18%, 41.88%)  [149]=365740 ( 0.99%, 77.35%)  [201]=  1630 ( 0.00%, 99.96%)  [253]=     1 ( 0.00%,100.00%)
[ 46]=336312 ( 0.91%, 19.33%)  [ 98]= 68563 ( 0.19%, 42.06%)  [150]=313902 ( 0.85%, 78.20%)  [202]=  1698 ( 0.00%, 99.97%)  [254]=     1 ( 0.00%,100.00%)
[ 47]=380812 ( 1.03%, 20.37%)  [ 99]= 66146 ( 0.18%, 42.24%)  [151]=354325 ( 0.96%, 79.16%)  [203]=  1242 ( 0.00%, 99.97%)  [255]=    43 ( 0.00%,100.00%)
[ 48]=374008 ( 1.02%, 21.38%)  [100]= 68162 ( 0.19%, 42.43%)  [152]=347937 ( 0.95%, 80.11%)  [204]=  1182 ( 0.00%, 99.98%)
[ 49]=372661 ( 1.01%, 22.40%)  [101]= 74701 ( 0.20%, 42.63%)  [153]=350481 ( 0.95%, 81.06%)  [205]=  1103 ( 0.00%, 99.98%)
[ 50]=366546 ( 1.00%, 23.39%)  [102]= 71356 ( 0.19%, 42.82%)  [154]=342912 ( 0.93%, 81.99%)  [206]=   949 ( 0.00%, 99.98%)
[ 51]=323366 ( 0.88%, 24.27%)  [103]= 74680 ( 0.20%, 43.03%)  [155]=319199 ( 0.87%, 82.86%)  [207]=   809 ( 0.00%, 99.98%)
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USGS – Channel 5 (VNIR-SWIR)

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FILE dec.5

TOTAL NUMBER OF PIXELS =    58911381
IMAGE PIXELS           =    38980517 (66.17%)
BACKGROUND PIXELS      =    19930864 (33.83%)
MINIMUM                =           1
MAXIMUM                =         255
LEFT  BOUND 2%         =          13
RIGHT BOUND 2%         =         180
MEAN                   =     105.182
VARIANCE               =    2686.212
STANDARD DEVIATION     =      51.829
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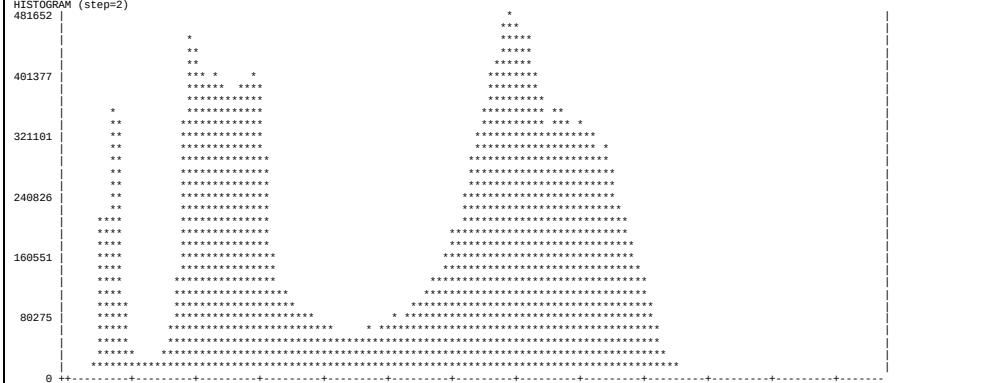


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[  0]=     0 ( 0.00%,  0.00%)  [ 52]=370965 ( 0.95%, 24.43%)  [104]= 78705 ( 0.20%, 42.84%)  [156]=348251 ( 0.89%, 81.78%)  [208]=   780 ( 0.00%, 99.98%)
[  1]=     2 ( 0.00%,  0.00%)  [ 53]=349210 ( 0.90%, 25.33%)  [105]= 80045 ( 0.21%, 43.05%)  [157]=321646 ( 0.83%, 82.61%)  [209]=   773 ( 0.00%, 99.99%)
[  2]=     0 ( 0.00%,  0.00%)  [ 54]=398851 ( 1.02%, 26.35%)  [106]= 82857 ( 0.21%, 43.26%)  [158]=321042 ( 0.82%, 83.43%)  [210]=   613 ( 0.00%, 99.99%)
[  3]=     0 ( 0.00%,  0.00%)  [ 55]=355135 ( 0.91%, 27.26%)  [107]= 89436 ( 0.23%, 43.49%)  [159]=327474 ( 0.84%, 84.27%)  [211]=   552 ( 0.00%, 99.99%)
[  4]=     0 ( 0.00%,  0.00%)  [ 56]=376091 ( 0.96%, 28.23%)  [108]= 93891 ( 0.24%, 43.73%)  [160]=337072 ( 0.86%, 85.14%)  [212]=   508 ( 0.00%, 99.99%)
[  5]=     5 ( 0.00%,  0.00%)  [ 57]=390974 ( 1.00%, 29.23%)  [109]= 97993 ( 0.25%, 43.98%)  [161]=344988 ( 0.89%, 86.02%)  [213]=   441 ( 0.00%, 99.99%)
[  6]=   276 ( 0.00%,  0.00%)  [ 58]=393160 ( 1.01%, 30.24%)  [110]=102909 ( 0.26%, 44.25%)  [162]=329724 ( 0.85%, 86.87%)  [214]=   397 ( 0.00%, 99.99%)
[  7]=   549 ( 0.00%,  0.00%)  [ 59]=403429 ( 1.03%, 31.27%)  [111]=108523 ( 0.28%, 44.52%)  [163]=323893 ( 0.83%, 87.70%)  [215]=   334 ( 0.00%, 99.99%)
[  8]=   652 ( 0.00%,  0.00%)  [ 60]=395404 ( 1.01%, 32.29%)  [112]=114440 ( 0.29%, 44.82%)  [164]=332247 ( 0.85%, 88.55%)  [216]=   269 ( 0.00%, 99.99%)
[  9]= 21484 ( 0.06%,  0.06%)  [ 61]=352928 ( 0.91%, 33.19%)  [113]=121106 ( 0.31%, 45.13%)  [165]=324972 ( 0.83%, 89.39%)  [217]=   241 ( 0.00%,100.00%)
[ 10]=153680 ( 0.39%,  0.45%)  [ 62]=303084 ( 0.78%, 33.97%)  [114]=128183 ( 0.33%, 45.46%)  [166]=300926 ( 0.77%, 90.16%)  [218]=   239 ( 0.00%,100.00%)
[ 11]=224123 ( 0.57%,  1.03%)  [ 63]=215714 ( 0.55%, 34.52%)  [115]=133922 ( 0.34%, 45.80%)  [167]=303066 ( 0.78%, 90.94%)  [219]=   183 ( 0.00%,100.00%)
[ 12]=204934 ( 0.53%,  1.55%)  [ 64]=173546 ( 0.45%, 34.97%)  [116]=136347 ( 0.35%, 46.15%)  [168]=306891 ( 0.79%, 91.72%)  [220]=   155 ( 0.00%,100.00%)
[ 13]=221712 ( 0.57%,  2.12%)  [ 65]=143745 ( 0.37%, 35.34%)  [117]=140073 ( 0.36%, 46.51%)  [169]=294705 ( 0.76%, 92.48%)  [221]=   142 ( 0.00%,100.00%)
[ 14]=295644 ( 0.76%,  2.88%)  [ 66]=126710 ( 0.33%, 35.66%)  [118]=155385 ( 0.40%, 46.91%)  [170]=281475 ( 0.72%, 93.20%)  [222]=   138 ( 0.00%,100.00%)
[ 15]=360937 ( 0.93%,  3.81%)  [ 67]=108842 ( 0.28%, 35.94%)  [119]=166856 ( 0.43%, 47.34%)  [171]=263032 ( 0.67%, 93.88%)  [223]=   119 ( 0.00%,100.00%)
[ 16]=340447 ( 0.87%,  4.68%)  [ 68]=113471 ( 0.29%, 36.23%)  [120]=189425 ( 0.49%, 47.82%)  [172]=236781 ( 0.61%, 94.48%)  [224]=    87 ( 0.00%,100.00%)
[ 17]=233068 ( 0.60%,  5.28%)  [ 69]=106547 ( 0.27%, 36.51%)  [121]=193805 ( 0.50%, 48.32%)  [173]=227994 ( 0.58%, 95.07%)  [225]=    84 ( 0.00%,100.00%)
[ 18]=105928 ( 0.27%,  5.55%)  [ 70]=109028 ( 0.28%, 36.79%)  [122]=201794 ( 0.52%, 48.84%)  [174]=217185 ( 0.56%, 95.62%)  [226]=    51 ( 0.00%,100.00%)
[ 19]= 63314 ( 0.16%,  5.71%)  [ 71]=106038 ( 0.27%, 37.06%)  [123]=202790 ( 0.52%, 49.36%)  [175]=197873 ( 0.51%, 96.13%)  [227]=    67 ( 0.00%,100.00%)
[ 20]= 44026 ( 0.11%,  5.83%)  [ 72]= 95379 ( 0.24%, 37.30%)  [124]=209647 ( 0.54%, 49.90%)  [176]=184986 ( 0.47%, 96.61%)  [228]=    48 ( 0.00%,100.00%)
[ 21]= 36722 ( 0.09%,  5.92%)  [ 73]= 89944 ( 0.23%, 37.53%)  [125]=248971 ( 0.64%, 50.53%)  [177]=188611 ( 0.48%, 97.09%)  [229]=    48 ( 0.00%,100.00%)
[ 22]= 28519 ( 0.07%,  5.99%)  [ 74]= 85692 ( 0.22%, 37.75%)  [126]=268474 ( 0.69%, 51.22%)  [178]=159608 ( 0.41%, 97.50%)  [230]=    45 ( 0.00%,100.00%)
[ 23]= 25750 ( 0.07%,  6.06%)  [ 75]= 82814 ( 0.21%, 37.97%)  [127]=296090 ( 0.76%, 51.98%)  [179]=146464 ( 0.38%, 97.88%)  [231]=    26 ( 0.00%,100.00%)
[ 24]= 23477 ( 0.06%,  6.12%)  [ 76]= 81916 ( 0.21%, 38.18%)  [128]=321416 ( 0.82%, 52.81%)  [180]=133862 ( 0.34%, 98.22%)  [232]=    37 ( 0.00%,100.00%)
[ 25]= 22615 ( 0.06%,  6.18%)  [ 77]= 78395 ( 0.20%, 38.38%)  [129]=331154 ( 0.85%, 53.66%)  [181]=127660 ( 0.33%, 98.55%)  [233]=    41 ( 0.00%,100.00%)
[ 26]= 22270 ( 0.06%,  6.23%)  [ 78]= 74932 ( 0.19%, 38.57%)  [130]=342582 ( 0.88%, 54.54%)  [182]=108266 ( 0.28%, 98.82%)  [234]=    25 ( 0.00%,100.00%)
[ 27]= 23446 ( 0.06%,  6.29%)  [ 79]= 71721 ( 0.18%, 38.75%)  [131]=365601 ( 0.94%, 55.47%)  [183]= 88839 ( 0.23%, 99.05%)  [235]=    22 ( 0.00%,100.00%)
[ 28]= 25576 ( 0.07%,  6.36%)  [ 80]= 68732 ( 0.18%, 38.93%)  [132]=388892 ( 1.00%, 56.47%)  [184]= 66975 ( 0.17%, 99.22%)  [236]=    12 ( 0.00%,100.00%)
[ 29]= 29218 ( 0.07%,  6.43%)  [ 81]= 65947 ( 0.17%, 39.10%)  [133]=411382 ( 1.06%, 57.53%)  [185]= 63166 ( 0.16%, 99.39%)  [237]=    11 ( 0.00%,100.00%)
[ 30]= 34353 ( 0.09%,  6.52%)  [ 82]= 64422 ( 0.17%, 39.26%)  [134]=428564 ( 1.10%, 58.63%)  [186]= 42431 ( 0.11%, 99.50%)  [238]=    16 ( 0.00%,100.00%)
[ 31]= 42584 ( 0.11%,  6.63%)  [ 83]= 58732 ( 0.15%, 39.41%)  [135]=433430 ( 1.11%, 59.74%)  [187]= 36570 ( 0.09%, 99.59%)  [239]=    17 ( 0.00%,100.00%)
[ 32]= 49913 ( 0.13%,  6.76%)  [ 84]= 57185 ( 0.15%, 39.56%)  [136]=470521 ( 1.21%, 60.94%)  [188]= 29049 ( 0.08%, 99.67%)  [240]=    12 ( 0.00%,100.00%)
[ 33]= 65871 ( 0.17%,  6.93%)  [ 85]= 60044 ( 0.15%, 39.72%)  [137]=464542 ( 1.19%, 62.14%)  [189]= 23601 ( 0.06%, 99.73%)  [241]=    13 ( 0.00%,100.00%)
[ 34]= 87939 ( 0.23%,  7.15%)  [ 86]= 59528 ( 0.15%, 39.87%)  [138]=481652 ( 1.24%, 63.37%)  [190]= 19030 ( 0.05%, 99.78%)  [242]=     6 ( 0.00%,100.00%)
[ 35]=142910 ( 0.37%,  7.52%)  [ 87]= 60763 ( 0.16%, 40.02%)  [139]=480927 ( 1.23%, 64.61%)  [191]= 14718 ( 0.04%, 99.81%)  [243]=     9 ( 0.00%,100.00%)
[ 36]=227766 ( 0.58%,  8.11%)  [ 88]= 57878 ( 0.15%, 40.17%)  [140]=480076 ( 1.23%, 65.84%)  [192]= 11615 ( 0.03%, 99.84%)  [244]=     4 ( 0.00%,100.00%)
[ 37]=349345 ( 0.90%,  9.00%)  [ 89]= 56413 ( 0.14%, 40.32%)  [141]=463547 ( 1.19%, 67.03%)  [193]= 10110 ( 0.03%, 99.87%)  [245]=     7 ( 0.00%,100.00%)
[ 38]=438962 ( 1.13%, 10.13%)  [ 90]= 56294 ( 0.14%, 40.46%)  [142]=456868 ( 1.17%, 68.20%)  [194]=  8174 ( 0.02%, 99.89%)  [246]=    10 ( 0.00%,100.00%)
[ 39]=460835 ( 1.18%, 11.31%)  [ 91]= 56817 ( 0.15%, 40.61%)  [143]=445988 ( 1.14%, 69.34%)  [195]=  6508 ( 0.02%, 99.91%)  [247]=     4 ( 0.00%,100.00%)
[ 40]=433620 ( 1.11%, 12.42%)  [ 92]= 60593 ( 0.15%, 40.76%)  [144]=450135 ( 1.17%, 70.51%)  [196]=  5275 ( 0.01%, 99.92%)  [248]=     6 ( 0.00%,100.00%)
[ 41]=405934 ( 1.04%, 13.46%)  [ 93]= 58894 ( 0.15%, 40.91%)  [145]=418262 ( 1.07%, 71.59%)  [197]=  4551 ( 0.01%, 99.93%)  [249]=     2 ( 0.00%,100.00%)
[ 42]=383425 ( 0.98%, 14.45%)  [ 94]= 59047 ( 0.15%, 41.07%)  [146]=405163 ( 1.04%, 72.62%)  [198]=  3528 ( 0.01%, 99.94%)  [250]=     5 ( 0.00%,100.00%)
[ 43]=404453 ( 1.04%, 15.49%)  [ 95]= 66004 ( 0.17%, 41.23%)  [147]=400773 ( 1.03%, 73.65%)  [199]=  3102 ( 0.01%, 99.95%)  [251]=     3 ( 0.00%,100.00%)
[ 44]=377684 ( 0.97%, 16.45%)  [ 96]= 60860 ( 0.16%, 41.39%)  [148]=382385 ( 0.98%, 74.63%)  [200]=  2838 ( 0.01%, 99.96%)  [252]=     0 ( 0.00%,100.00%)
[ 45]=400485 ( 1.03%, 17.48%)  [ 97]= 60612 ( 0.16%, 41.55%)  [149]=367745 ( 0.94%, 75.58%)  [201]=  2398 ( 0.01%, 99.96%)  [253]=     1 ( 0.00%,100.00%)
[ 46]=409404 ( 1.05%, 18.53%)  [ 98]= 66378 ( 0.17%, 41.72%)  [150]=335769 ( 0.86%, 76.44%)  [202]=  2076 ( 0.01%, 99.97%)  [254]=     6 ( 0.00%,100.00%)
[ 47]=402593 ( 1.03%, 19.56%)  [ 99]= 68734 ( 0.18%, 41.89%)  [151]=389977 ( 0.80%, 77.23%)  [203]=  1665 ( 0.00%, 99.97%)  [255]=    40 ( 0.00%,100.00%)
[ 48]=399536 ( 1.02%, 20.59%)  [100]= 68461 ( 0.18%, 42.07%)  [152]=349064 ( 0.90%, 78.13%)  [204]=  1348 ( 0.00%, 99.97%)
[ 49]=384646 ( 0.99%, 21.58%)  [101]= 69789 ( 0.18%, 42.25%)  [153]=363913 ( 0.93%, 79.06%)  [205]=  1190 ( 0.00%, 99.98%)
[ 50]=363897 ( 0.93%, 22.51%)  [102]= 72642 ( 0.19%, 42.43%)  [154]=359349 ( 0.92%, 79.98%)  [206]=  1041 ( 0.00%, 99.98%)
[ 51]=377985 ( 0.97%, 23.48%)  [103]= 80362 ( 0.21%, 42.64%)  [155]=353133 ( 0.91%, 80.89%)  [207]=   870 ( 0.00%, 99.98%)
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ESA – Channel 7 (VNIR-SWIR)

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FILE dec.6

TOTAL NUMBER OF PIXELS =    51577456
IMAGE PIXELS           =    36794269 (71.34%)
BACKGROUND PIXELS      =    14783187 (28.66%)
MINIMUM                =           3
MAXIMUM                =         255
LEFT  BOUND 2%         =          10
RIGHT BOUND 2%         =         157
MEAN                   =      84.907
VARIANCE               =    2336.051
STANDARD DEVIATION     =      48.333
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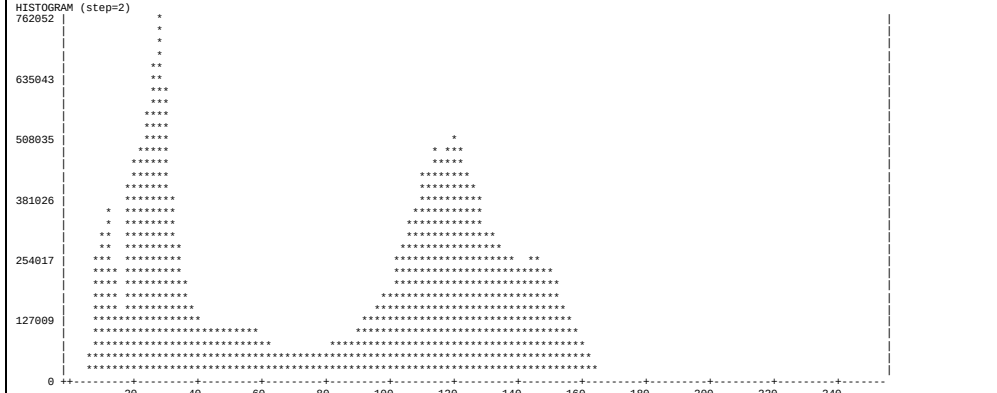


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[  0]=     0 ( 0.00%,  0.00%)  [ 52]=112892 ( 0.31%, 35.94%)  [104]=258361 ( 0.70%, 50.93%)  [156]=148343 ( 0.40%, 97.94%)  [208]=    12 ( 0.00%,100.00%)
[  1]=     0 ( 0.00%,  0.00%)  [ 53]=110281 ( 0.30%, 36.24%)  [105]=295472 ( 0.80%, 51.73%)  [157]=129269 ( 0.35%, 98.29%)  [209]=     4 ( 0.00%,100.00%)
[  2]=     0 ( 0.00%,  0.00%)  [ 54]=117465 ( 0.32%, 36.56%)  [106]=303471 ( 0.82%, 52.56%)  [158]=105472 ( 0.29%, 98.57%)  [210]=     8 ( 0.00%,100.00%)
[  3]=     1 ( 0.00%,  0.00%)  [ 55]=116491 ( 0.32%, 36.87%)  [107]=343705 ( 0.93%, 53.49%)  [159]= 96973 ( 0.26%, 98.84%)  [211]=     9 ( 0.00%,100.00%)
[  4]=     0 ( 0.00%,  0.00%)  [ 56]=107439 ( 0.29%, 37.17%)  [108]=368293 ( 1.00%, 54.49%)  [160]= 78623 ( 0.21%, 99.05%)  [212]=     6 ( 0.00%,100.00%)
[  5]=   157 ( 0.00%,  0.00%)  [ 57]= 96163 ( 0.26%, 37.43%)  [109]=371804 ( 1.01%, 55.50%)  [161]= 69909 ( 0.19%, 99.24%)  [213]=     4 ( 0.00%,100.00%)
[  6]=  4884 ( 0.01%,  0.01%)  [ 58]=106897 ( 0.29%, 37.72%)  [110]=419295 ( 1.14%, 56.64%)  [162]= 52240 ( 0.14%, 99.38%)  [214]=     9 ( 0.00%,100.00%)
[  7]= 52085 ( 0.14%,  0.16%)  [ 59]= 99622 ( 0.27%, 37.99%)  [111]=440674 ( 1.20%, 57.84%)  [163]= 48528 ( 0.13%, 99.51%)  [215]=     2 ( 0.00%,100.00%)
[  8]=169964 ( 0.46%,  0.62%)  [ 60]= 89395 ( 0.24%, 38.23%)  [112]=433101 ( 1.18%, 59.02%)  [164]= 35717 ( 0.10%, 99.61%)  [216]=     4 ( 0.00%,100.00%)
[  9]=269572 ( 0.73%,  1.35%)  [ 61]= 83839 ( 0.23%, 38.46%)  [113]=446990 ( 1.21%, 60.23%)  [165]= 30786 ( 0.08%, 99.70%)  [217]=     2 ( 0.00%,100.00%)
[ 10]=258340 ( 0.70%,  2.05%)  [ 62]= 84111 ( 0.23%, 38.69%)  [114]=488633 ( 1.33%, 61.56%)  [166]= 22496 ( 0.06%, 99.76%)  [218]=     6 ( 0.00%,100.00%)
[ 11]=325706 ( 0.89%,  2.94%)  [ 63]= 79107 ( 0.21%, 38.90%)  [115]=495101 ( 1.35%, 62.90%)  [167]= 16459 ( 0.04%, 99.80%)  [219]=     5 ( 0.00%,100.00%)
[ 12]=364864 ( 0.99%,  3.93%)  [ 64]= 75111 ( 0.20%, 39.11%)  [116]=467427 ( 1.27%, 64.17%)  [168]= 13502 ( 0.04%, 99.84%)  [220]=     1 ( 0.00%,100.00%)
[ 13]=311358 ( 0.85%,  4.78%)  [ 65]= 63229 ( 0.17%, 39.28%)  [117]=476229 ( 1.29%, 65.47%)  [169]= 12355 ( 0.03%, 99.87%)  [221]=     5 ( 0.00%,100.00%)
[ 14]=230529 ( 0.63%,  5.40%)  [ 66]= 61362 ( 0.17%, 39.45%)  [118]=453119 ( 1.23%, 66.70%)  [170]=  9283 ( 0.03%, 99.90%)  [222]=     2 ( 0.00%,100.00%)
[ 15]=120463 ( 0.33%,  5.73%)  [ 67]= 59044 ( 0.16%, 39.61%)  [119]=484512 ( 1.32%, 68.02%)  [171]=  7577 ( 0.02%, 99.92%)  [223]=     4 ( 0.00%,100.00%)
[ 16]= 91095 ( 0.25%,  5.98%)  [ 68]= 66463 ( 0.18%, 39.79%)  [120]=514976 ( 1.40%, 69.42%)  [172]=  5874 ( 0.02%, 99.93%)  [224]=     2 ( 0.00%,100.00%)
[ 17]=132574 ( 0.36%,  6.34%)  [ 69]= 61775 ( 0.17%, 39.96%)  [121]=443980 ( 1.21%, 70.62%)  [173]=  4416 ( 0.01%, 99.95%)  [225]=     3 ( 0.00%,100.00%)
[ 18]=287517 ( 0.78%,  7.12%)  [ 70]= 61879 ( 0.17%, 40.12%)  [122]=499040 ( 1.36%, 71.98%)  [174]=  3626 ( 0.01%, 99.95%)  [226]=     6 ( 0.00%,100.00%)
[ 19]=407254 ( 1.11%,  8.23%)  [ 71]= 65260 ( 0.18%, 40.30%)  [123]=486330 ( 1.32%, 73.30%)  [175]=  2646 ( 0.01%, 99.96%)  [227]=     0 ( 0.00%,100.00%)
[ 20]=406557 ( 1.10%,  9.33%)  [ 72]= 64941 ( 0.18%, 40.48%)  [124]=435202 ( 1.18%, 74.48%)  [176]=  2463 ( 0.01%, 99.97%)  [228]=     3 ( 0.00%,100.00%)
[ 21]=467247 ( 1.27%, 10.60%)  [ 73]= 64644 ( 0.18%, 40.65%)  [125]=454251 ( 1.23%, 75.72%)  [177]=  1913 ( 0.01%, 99.97%)  [229]=     3 ( 0.00%,100.00%)
[ 22]=440542 ( 1.20%, 11.80%)  [ 74]= 62412 ( 0.17%, 40.82%)  [126]=382605 ( 1.04%, 76.76%)  [178]=  1538 ( 0.00%, 99.98%)  [230]=     1 ( 0.00%,100.00%)
[ 23]=492791 ( 1.34%, 13.14%)  [ 75]= 67326 ( 0.18%, 41.01%)  [127]=414025 ( 1.13%, 77.88%)  [179]=  1105 ( 0.00%, 99.98%)  [231]=     2 ( 0.00%,100.00%)
[ 24]=527361 ( 1.43%, 14.57%)  [ 76]= 68793 ( 0.19%, 41.19%)  [128]=390626 ( 1.06%, 78.95%)  [180]=  1116 ( 0.00%, 99.98%)  [232]=     2 ( 0.00%,100.00%)
[ 25]=565966 ( 1.54%, 16.11%)  [ 77]= 70102 ( 0.19%, 41.38%)  [129]=371386 ( 1.01%, 79.96%)  [181]=   999 ( 0.00%, 99.99%)  [233]=     1 ( 0.00%,100.00%)
[ 26]=632449 ( 1.72%, 17.83%)  [ 78]= 67582 ( 0.18%, 41.57%)  [130]=322936 ( 0.88%, 80.83%)  [182]=   659 ( 0.00%, 99.99%)  [234]=     2 ( 0.00%,100.00%)
[ 27]=662230 ( 1.80%, 19.63%)  [ 79]= 68700 ( 0.19%, 41.75%)  [131]=329802 ( 0.90%, 81.73%)  [183]=   629 ( 0.00%, 99.99%)  [235]=     0 ( 0.00%,100.00%)
[ 28]=762052 ( 2.07%, 21.70%)  [ 80]= 71641 ( 0.19%, 41.95%)  [132]=312587 ( 0.85%, 82.58%)  [184]=   564 ( 0.00%, 99.99%)  [236]=     1 ( 0.00%,100.00%)
[ 29]=716663 ( 1.95%, 23.65%)  [ 81]= 73189 ( 0.20%, 42.15%)  [133]=261298 ( 0.71%, 83.29%)  [185]=   426 ( 0.00%, 99.99%)  [237]=     1 ( 0.00%,100.00%)
[ 30]=612610 ( 1.66%, 25.31%)  [ 82]= 80135 ( 0.22%, 42.37%)  [134]=284057 ( 0.77%, 84.06%)  [186]=   366 ( 0.00%, 99.99%)  [238]=     0 ( 0.00%,100.00%)
[ 31]=491601 ( 1.34%, 26.65%)  [ 83]= 82929 ( 0.23%, 42.59%)  [135]=274798 ( 0.75%, 84.81%)  [187]=   323 ( 0.00%, 99.99%)  [239]=     1 ( 0.00%,100.00%)
[ 32]=406377 ( 1.10%, 27.75%)  [ 84]= 75203 ( 0.20%, 42.80%)  [136]=266380 ( 0.72%, 85.53%)  [188]=   276 ( 0.00%,100.00%)  [240]=     0 ( 0.00%,100.00%)
[ 33]=313771 ( 0.85%, 28.60%)  [ 85]= 89133 ( 0.24%, 43.04%)  [137]=260449 ( 0.71%, 86.24%)  [189]=   213 ( 0.00%,100.00%)  [241]=     0 ( 0.00%,100.00%)
[ 34]=295761 ( 0.80%, 29.41%)  [ 86]= 93416 ( 0.25%, 43.29%)  [138]=256687 ( 0.70%, 86.94%)  [190]=   197 ( 0.00%,100.00%)  [242]=     1 ( 0.00%,100.00%)
[ 35]=201125 ( 0.55%, 29.95%)  [ 87]= 97001 ( 0.26%, 43.55%)  [139]=254776 ( 0.69%, 87.63%)  [191]=   136 ( 0.00%,100.00%)  [243]=     0 ( 0.00%,100.00%)
[ 36]=226002 ( 0.61%, 30.57%)  [ 88]=100060 ( 0.27%, 43.83%)  [140]=239609 ( 0.65%, 88.28%)  [192]=   162 ( 0.00%,100.00%)  [244]=     0 ( 0.00%,100.00%)
[ 37]=199606 ( 0.54%, 31.11%)  [ 89]= 98362 ( 0.27%, 44.09%)  [141]=223903 ( 0.61%, 88.89%)  [193]=   119 ( 0.00%,100.00%)  [245]=     0 ( 0.00%,100.00%)
[ 38]=174950 ( 0.48%, 31.59%)  [ 90]=109678 ( 0.30%, 44.39%)  [142]=227132 ( 0.62%, 89.51%)  [194]=   108 ( 0.00%,100.00%)  [246]=     0 ( 0.00%,100.00%)
[ 39]=122296 ( 0.33%, 31.92%)  [ 91]=100461 ( 0.27%, 44.67%)  [143]=230187 ( 0.63%, 90.13%)  [195]=    90 ( 0.00%,100.00%)  [247]=     0 ( 0.00%,100.00%)
[ 40]=117637 ( 0.32%, 32.23%)  [ 92]=106064 ( 0.29%, 44.95%)  [144]=240961 ( 0.67%, 90.80%)  [196]=    69 ( 0.00%,100.00%)  [248]=     1 ( 0.00%,100.00%)
[ 41]=136651 ( 0.37%, 32.69%)  [ 93]=128359 ( 0.35%, 45.30%)  [145]=266045 ( 0.72%, 91.52%)  [197]=    55 ( 0.00%,100.00%)  [249]=     0 ( 0.00%,100.00%)
[ 42]=110427 ( 0.30%, 32.99%)  [ 94]=118433 ( 0.32%, 45.62%)  [146]=231398 ( 0.63%, 92.15%)  [198]=    50 ( 0.00%,100.00%)  [250]=     1 ( 0.00%,100.00%)
[ 43]=121310 ( 0.33%, 33.32%)  [ 95]=143418 ( 0.39%, 46.01%)  [147]=264096 ( 0.72%, 92.87%)  [199]=    66 ( 0.00%,100.00%)  [251]=     0 ( 0.00%,100.00%)
[ 44]=114853 ( 0.31%, 33.63%)  [ 96]=153771 ( 0.42%, 46.43%)  [148]=244473 ( 0.66%, 93.54%)  [200]=    33 ( 0.00%,100.00%)  [252]=     0 ( 0.00%,100.00%)
[ 45]= 96716 ( 0.26%, 33.90%)  [ 97]=165624 ( 0.45%, 46.88%)  [149]=253262 ( 0.69%, 94.22%)  [201]=    32 ( 0.00%,100.00%)  [253]=     0 ( 0.00%,100.00%)
[ 46]=108830 ( 0.30%, 34.19%)  [ 98]=164698 ( 0.45%, 47.33%)  [150]=241934 ( 0.66%, 94.88%)  [202]=    30 ( 0.00%,100.00%)  [254]=     6 ( 0.00%,100.00%)
[ 47]=106488 ( 0.29%, 34.48%)  [ 99]=179018 ( 0.49%, 47.82%)  [151]=232486 ( 0.63%, 95.51%)  [203]=    22 ( 0.00%,100.00%)  [255]=    27 ( 0.00%,100.00%)
[ 48]=105374 ( 0.29%, 34.77%)  [100]=203005 ( 0.55%, 48.37%)  [152]=216722 ( 0.59%, 96.10%)  [204]=    13 ( 0.00%,100.00%)
[ 49]= 99434 ( 0.27%, 35.04%)  [101]=191031 ( 0.52%, 48.89%)  [153]=200919 ( 0.55%, 96.65%)  [205]=    17 ( 0.00%,100.00%)
[ 50]=107355 ( 0.29%, 35.33%)  [102]=235542 ( 0.64%, 49.53%)  [154]=173883 ( 0.47%, 97.12%)  [206]=    13 ( 0.00%,100.00%)
[ 51]=111321 ( 0.30%, 35.63%)  [103]=257099 ( 0.70%, 50.23%)  [155]=151419 ( 0.41%, 97.53%)  [207]=     8 ( 0.00%,100.00%)
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USGS – Channel 7 (VNIR-SWIR)

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FILE dec.6

TOTAL NUMBER OF PIXELS =    58911381
IMAGE PIXELS           =    38980486 (66.17%)
BACKGROUND PIXELS      =    19930895 (33.83%)
MINIMUM                =           1
MAXIMUM                =         255
LEFT  BOUND 2%         =          11
RIGHT BOUND 2%         =         158
MEAN                   =      86.011
VARIANCE               =    2375.812
STANDARD DEVIATION     =      48.742
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HISTOGRAM (step=2)


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[  0]=     0 ( 0.00%,  0.00%)  [ 52]=118698 ( 0.30%, 35.87%)  [104]=280753 ( 0.72%, 50.26%)  [156]=183698 ( 0.47%, 97.44%)  [208]=     9 ( 0.00%,100.00%)
[  1]=     9 ( 0.00%,  0.00%)  [ 53]=120289 ( 0.31%, 36.18%)  [105]=203615 ( 0.52%, 50.78%)  [157]=147763 ( 0.38%, 97.82%)  [209]=     8 ( 0.00%,100.00%)
[  2]=     0 ( 0.00%,  0.00%)  [ 54]=110440 ( 0.28%, 36.46%)  [106]=315393 ( 0.81%, 51.59%)  [158]=145248 ( 0.37%, 98.19%)  [210]=     7 ( 0.00%,100.00%)
[  3]=     4 ( 0.00%,  0.00%)  [ 55]=122129 ( 0.31%, 36.77%)  [107]=341660 ( 0.88%, 52.46%)  [159]=115951 ( 0.30%, 98.49%)  [211]=     8 ( 0.00%,100.00%)
[  4]=    23 ( 0.00%,  0.00%)  [ 56]=121347 ( 0.31%, 37.09%)  [108]=297936 ( 0.76%, 53.23%)  [160]=108378 ( 0.28%, 98.77%)  [212]=    10 ( 0.00%,100.00%)
[  5]=   261 ( 0.00%,  0.00%)  [ 57]=109782 ( 0.28%, 37.37%)  [109]=385702 ( 0.99%, 54.22%)  [161]= 90486 ( 0.23%, 99.00%)  [213]=     4 ( 0.00%,100.00%)
[  6]=  1495 ( 0.00%,  0.00%)  [ 58]=119374 ( 0.31%, 37.67%)  [110]=421116 ( 1.08%, 55.30%)  [162]= 59039 ( 0.15%, 99.15%)  [214]=     6 ( 0.00%,100.00%)
[  7]=  7065 ( 0.02%,  0.02%)  [ 59]=110780 ( 0.28%, 37.96%)  [111]=392034 ( 1.01%, 56.30%)  [163]= 68210 ( 0.17%, 99.33%)  [215]=     5 ( 0.00%,100.00%)
[  8]= 55320 ( 0.14%,  0.16%)  [ 60]= 92021 ( 0.24%, 38.19%)  [112]=456934 ( 1.17%, 57.48%)  [164]= 56437 ( 0.14%, 99.47%)  [216]=     7 ( 0.00%,100.00%)
[  9]=188512 ( 0.48%,  0.65%)  [ 61]= 97580 ( 0.25%, 38.44%)  [113]=477953 ( 1.23%, 58.70%)  [165]= 35846 ( 0.09%, 99.56%)  [217]=     1 ( 0.00%,100.00%)
[ 10]=281392 ( 0.72%,  1.37%)  [ 62]= 86819 ( 0.22%, 38.67%)  [114]=468784 ( 1.20%, 59.91%)  [166]= 36345 ( 0.09%, 99.66%)  [218]=     5 ( 0.00%,100.00%)
[ 11]=254598 ( 0.65%,  2.02%)  [ 63]= 86493 ( 0.22%, 38.89%)  [115]=497998 ( 1.28%, 61.18%)  [167]= 28266 ( 0.07%, 99.73%)  [219]=     3 ( 0.00%,100.00%)
[ 12]=341115 ( 0.88%,  2.90%)  [ 64]= 81507 ( 0.21%, 39.10%)  [116]=510406 ( 1.31%, 62.49%)  [168]= 20985 ( 0.05%, 99.78%)  [220]=     5 ( 0.00%,100.00%)
[ 13]=448903 ( 1.15%,  4.05%)  [ 65]= 67666 ( 0.17%, 39.27%)  [117]=464201 ( 1.19%, 63.68%)  [169]= 18123 ( 0.05%, 99.83%)  [221]=     4 ( 0.00%,100.00%)
[ 14]=331363 ( 0.85%,  4.90%)  [ 66]= 73887 ( 0.19%, 39.46%)  [118]=523704 ( 1.34%, 65.03%)  [170]= 14467 ( 0.04%, 99.87%)  [222]=     3 ( 0.00%,100.00%)
[ 15]=275329 ( 0.71%,  5.61%)  [ 67]= 71791 ( 0.18%, 39.65%)  [119]=488045 ( 1.25%, 66.28%)  [171]=  9600 ( 0.02%, 99.89%)  [223]=     2 ( 0.00%,100.00%)
[ 16]=128737 ( 0.33%,  5.94%)  [ 68]= 58478 ( 0.15%, 39.80%)  [120]=536265 ( 1.38%, 67.65%)  [172]=  8886 ( 0.02%, 99.91%)  [224]=     2 ( 0.00%,100.00%)
[ 17]= 61598 ( 0.16%,  6.09%)  [ 69]= 69592 ( 0.18%, 39.97%)  [121]=526536 ( 1.35%, 69.00%)  [173]=  6988 ( 0.02%, 99.93%)  [225]=     2 ( 0.00%,100.00%)
[ 18]=194879 ( 0.50%,  6.59%)  [ 70]= 69345 ( 0.18%, 40.15%)  [122]=421299 ( 1.08%, 70.09%)  [174]=  4494 ( 0.01%, 99.94%)  [226]=     3 ( 0.00%,100.00%)
[ 19]=361496 ( 0.93%,  7.52%)  [ 71]= 56686 ( 0.15%, 40.30%)  [123]=511197 ( 1.31%, 71.40%)  [175]=  4553 ( 0.01%, 99.95%)  [227]=     6 ( 0.00%,100.00%)
[ 20]=295413 ( 0.76%,  8.28%)  [ 72]= 66413 ( 0.17%, 40.47%)  [124]=505121 ( 1.30%, 72.69%)  [176]=  3407 ( 0.01%, 99.96%)  [228]=     1 ( 0.00%,100.00%)
[ 21]=516152 ( 1.32%,  9.60%)  [ 73]= 66672 ( 0.17%, 40.64%)  [125]=438755 ( 1.13%, 73.82%)  [177]=  2249 ( 0.01%, 99.97%)  [229]=     1 ( 0.00%,100.00%)
[ 22]=414927 ( 1.06%, 10.67%)  [ 74]= 52634 ( 0.14%, 40.77%)  [126]=466731 ( 1.20%, 75.02%)  [178]=  2109 ( 0.01%, 99.97%)  [230]=     3 ( 0.00%,100.00%)
[ 23]=506479 ( 1.30%, 11.97%)  [ 75]= 70943 ( 0.18%, 40.96%)  [127]=448278 ( 1.15%, 76.17%)  [179]=  1629 ( 0.00%, 99.98%)  [231]=     0 ( 0.00%,100.00%)
[ 24]=546142 ( 1.40%, 13.37%)  [ 76]= 71881 ( 0.18%, 41.14%)  [128]=398290 ( 1.02%, 77.19%)  [180]=  1460 ( 0.00%, 99.98%)  [232]=     2 ( 0.00%,100.00%)
[ 25]=537048 ( 1.38%, 14.75%)  [ 77]= 55469 ( 0.14%, 41.28%)  [129]=404769 ( 1.04%, 78.23%)  [181]=  1260 ( 0.00%, 99.99%)  [233]=     1 ( 0.00%,100.00%)
[ 26]=606414 ( 1.56%, 16.30%)  [ 78]= 73560 ( 0.19%, 41.47%)  [130]=379587 ( 0.97%, 79.20%)  [182]=   830 ( 0.00%, 99.99%)  [234]=     3 ( 0.00%,100.00%)
[ 27]=678758 ( 1.74%, 18.04%)  [ 79]= 64483 ( 0.17%, 41.64%)  [131]=324404 ( 0.83%, 80.03%)  [183]=   745 ( 0.00%, 99.99%)  [235]=     1 ( 0.00%,100.00%)
[ 28]=713763 ( 1.83%, 19.87%)  [ 80]= 76295 ( 0.20%, 41.83%)  [132]=351661 ( 0.90%, 80.93%)  [184]=   611 ( 0.00%, 99.99%)  [236]=     0 ( 0.00%,100.00%)
[ 29]=814552 ( 2.09%, 21.96%)  [ 81]= 78997 ( 0.20%, 42.03%)  [133]=333995 ( 0.86%, 81.79%)  [185]=   543 ( 0.00%, 99.99%)  [237]=     1 ( 0.00%,100.00%)
[ 30]=765099 ( 1.96%, 23.93%)  [ 82]= 69328 ( 0.18%, 42.21%)  [134]=207940 ( 0.53%, 82.32%)  [186]=   437 ( 0.00%, 99.99%)  [238]=     1 ( 0.00%,100.00%)
[ 31]=653432 ( 1.68%, 25.60%)  [ 83]= 83214 ( 0.21%, 42.43%)  [135]=313834 ( 0.81%, 83.13%)  [187]=   384 ( 0.00%, 99.99%)  [239]=     0 ( 0.00%,100.00%)
[ 32]=524043 ( 1.34%, 26.95%)  [ 84]= 86567 ( 0.22%, 42.65%)  [136]=304904 ( 0.78%, 83.91%)  [188]=   264 ( 0.00%,100.00%)  [240]=     0 ( 0.00%,100.00%)
[ 33]=431574 ( 1.11%, 28.05%)  [ 85]= 81378 ( 0.21%, 42.86%)  [137]=224053 ( 0.57%, 84.49%)  [189]=   251 ( 0.00%,100.00%)  [241]=     0 ( 0.00%,100.00%)
[ 34]=356019 ( 0.91%, 28.97%)  [ 86]= 93557 ( 0.24%, 43.10%)  [138]=285739 ( 0.73%, 85.22%)  [190]=   234 ( 0.00%,100.00%)  [242]=     0 ( 0.00%,100.00%)
[ 35]=309060 ( 0.79%, 29.76%)  [ 87]= 97586 ( 0.25%, 43.35%)  [139]=256070 ( 0.66%, 85.88%)  [191]=   130 ( 0.00%,100.00%)  [243]=     1 ( 0.00%,100.00%)
[ 36]=261037 ( 0.67%, 30.43%)  [ 88]= 92053 ( 0.24%, 43.58%)  [140]=279264 ( 0.72%, 86.59%)  [192]=   174 ( 0.00%,100.00%)  [244]=     0 ( 0.00%,100.00%)
[ 37]=229947 ( 0.59%, 31.02%)  [ 89]=102994 ( 0.26%, 43.85%)  [141]=283212 ( 0.73%, 87.32%)  [193]=   156 ( 0.00%,100.00%)  [245]=     2 ( 0.00%,100.00%)
[ 38]=201170 ( 0.52%, 31.54%)  [ 90]=109316 ( 0.28%, 44.13%)  [142]=269610 ( 0.69%, 88.01%)  [194]=    77 ( 0.00%,100.00%)  [246]=     0 ( 0.00%,100.00%)
[ 39]=180064 ( 0.46%, 32.00%)  [ 91]=111782 ( 0.29%, 44.42%)  [143]=294248 ( 0.75%, 88.77%)  [195]=   114 ( 0.00%,100.00%)  [247]=     0 ( 0.00%,100.00%)
[ 40]=177756 ( 0.46%, 32.46%)  [ 92]=119367 ( 0.31%, 44.73%)  [144]=297394 ( 0.76%, 89.53%)  [196]=    68 ( 0.00%,100.00%)  [248]=     0 ( 0.00%,100.00%)
[ 41]=150547 ( 0.39%, 32.79%)  [ 93]=126887 ( 0.33%, 45.05%)  [145]=288104 ( 0.74%, 90.27%)  [197]=    66 ( 0.00%,100.00%)  [249]=     0 ( 0.00%,100.00%)
[ 42]=104095 ( 0.27%, 33.06%)  [ 94]=121963 ( 0.31%, 45.36%)  [146]=307262 ( 0.79%, 91.06%)  [198]=    70 ( 0.00%,100.00%)  [250]=     1 ( 0.00%,100.00%)
[ 43]=135585 ( 0.35%, 33.40%)  [ 95]=145258 ( 0.37%, 45.73%)  [147]=307470 ( 0.79%, 91.85%)  [199]=    44 ( 0.00%,100.00%)  [251]=     0 ( 0.00%,100.00%)
[ 44]=127988 ( 0.33%, 33.73%)  [ 96]=155948 ( 0.40%, 46.13%)  [148]=241787 ( 0.62%, 92.47%)  [200]=    54 ( 0.00%,100.00%)  [252]=     0 ( 0.00%,100.00%)
[ 45]= 79759 ( 0.20%, 33.94%)  [ 97]=121947 ( 0.31%, 46.45%)  [149]=308067 ( 0.79%, 93.26%)  [201]=    36 ( 0.00%,100.00%)  [253]=     0 ( 0.00%,100.00%)
[ 46]=116525 ( 0.30%, 34.24%)  [ 98]=177293 ( 0.45%, 46.90%)  [150]=298526 ( 0.77%, 94.02%)  [202]=    28 ( 0.00%,100.00%)  [254]=     0 ( 0.00%,100.00%)
[ 47]=114626 ( 0.29%, 34.53%)  [ 99]=160338 ( 0.41%, 47.31%)  [151]=236190 ( 0.61%, 94.63%)  [203]=    31 ( 0.00%,100.00%)  [255]=    32 ( 0.00%,100.00%)
[ 48]= 86538 ( 0.22%, 34.75%)  [100]=197234 ( 0.51%, 47.82%)  [152]=261307 ( 0.67%, 95.30%)  [204]=    16 ( 0.00%,100.00%)
[ 49]=111519 ( 0.29%, 35.04%)  [101]=213434 ( 0.55%, 48.36%)  [153]=247651 ( 0.64%, 95.93%)  [205]=    10 ( 0.00%,100.00%)
[ 50]=112159 ( 0.29%, 35.33%)  [102]=196229 ( 0.50%, 48.87%)  [154]=196731 ( 0.50%, 96.44%)  [206]=    10 ( 0.00%,100.00%)
[ 51]= 93103 ( 0.24%, 35.56%)  [103]=260324 ( 0.67%, 49.54%)  [155]=207146 ( 0.53%, 96.97%)  [207]=     9 ( 0.00%,100.00%)
```

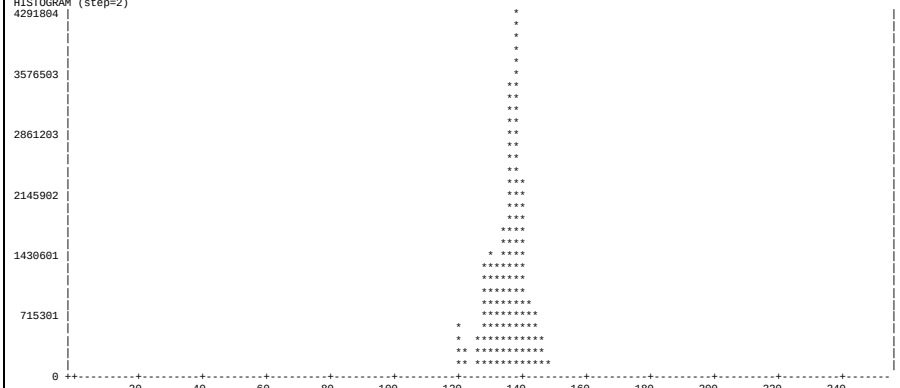
"This document discloses subject matter in which GAEL Consultant has proprietary rights. Recipient of this document shall not duplicate, use or disclose in whole or in part, information disclosed here on except for or on behalf of GAEL Consultant to fulfill the purpose for which the document was delivered to him."

ESA – Channel 6L (THERMAL)

```
FILE dec.7

TOTAL NUMBER OF PIXELS =    51577456
IMAGE PIXELS           =    36794756 (71.34%)
BACKGROUND PIXELS      =    14782700 (28.66%)
MINIMUM                =         113
MAXIMUM                =         203
LEFT  BOUND 2%         =         121
RIGHT BOUND 2%         =         147
MEAN                   =     135.891
VARIANCE               =      35.493
STANDARD DEVIATION     =       5.958
```

HISTOGRAM (step=2)




```
[  0]=      0 ( 0.00%,  0.00%) [ 52]=      0 ( 0.00%,  0.00%) [104]=      0 ( 0.00%,  0.00%) [156]=   1800 ( 0.00%,100.00%) [208]=      0 ( 0.00%,100.00%)
[  1]=      0 ( 0.00%,  0.00%) [ 53]=      0 ( 0.00%,  0.00%) [105]=      0 ( 0.00%,  0.00%) [157]=    632 ( 0.00%,100.00%) [209]=      0 ( 0.00%,100.00%)
[  2]=      0 ( 0.00%,  0.00%) [ 54]=      0 ( 0.00%,  0.00%) [106]=      0 ( 0.00%,  0.00%) [158]=    352 ( 0.00%,100.00%) [210]=      0 ( 0.00%,100.00%)
[  3]=      0 ( 0.00%,  0.00%) [ 55]=      0 ( 0.00%,  0.00%) [107]=      0 ( 0.00%,  0.00%) [159]=    108 ( 0.00%,100.00%) [211]=      0 ( 0.00%,100.00%)
[  4]=      0 ( 0.00%,  0.00%) [ 56]=      0 ( 0.00%,  0.00%) [108]=      0 ( 0.00%,  0.00%) [160]=     40 ( 0.00%,100.00%) [212]=      0 ( 0.00%,100.00%)
[  5]=      0 ( 0.00%,  0.00%) [ 57]=      0 ( 0.00%,  0.00%) [109]=      0 ( 0.00%,  0.00%) [161]=      0 ( 0.00%,100.00%) [213]=      0 ( 0.00%,100.00%)
[  6]=      0 ( 0.00%,  0.00%) [ 58]=      0 ( 0.00%,  0.00%) [110]=      0 ( 0.00%,  0.00%) [162]=     16 ( 0.00%,100.00%) [214]=      0 ( 0.00%,100.00%)
[  7]=      0 ( 0.00%,  0.00%) [ 59]=      0 ( 0.00%,  0.00%) [111]=      0 ( 0.00%,  0.00%) [163]=     20 ( 0.00%,100.00%) [215]=      0 ( 0.00%,100.00%)
[  8]=      0 ( 0.00%,  0.00%) [ 60]=      0 ( 0.00%,  0.00%) [112]=      0 ( 0.00%,  0.00%) [164]=     20 ( 0.00%,100.00%) [216]=      0 ( 0.00%,100.00%)
[  9]=      0 ( 0.00%,  0.00%) [ 61]=      0 ( 0.00%,  0.00%) [113]=      4 ( 0.00%,  0.00%) [165]=     24 ( 0.00%,100.00%) [217]=      0 ( 0.00%,100.00%)
[ 10]=      0 ( 0.00%,  0.00%) [ 62]=      0 ( 0.00%,  0.00%) [114]=    144 ( 0.00%,  0.00%) [166]=      8 ( 0.00%,100.00%) [218]=      0 ( 0.00%,100.00%)
[ 11]=      0 ( 0.00%,  0.00%) [ 63]=      0 ( 0.00%,  0.00%) [115]=   2056 ( 0.01%,  0.01%) [167]=      8 ( 0.00%,100.00%) [219]=      0 ( 0.00%,100.00%)
[ 12]=      0 ( 0.00%,  0.00%) [ 64]=      0 ( 0.00%,  0.00%) [116]=   3568 ( 0.01%,  0.02%) [168]=     12 ( 0.00%,100.00%) [220]=      0 ( 0.00%,100.00%)
[ 13]=      0 ( 0.00%,  0.00%) [ 65]=      0 ( 0.00%,  0.00%) [117]=   7372 ( 0.02%,  0.04%) [169]=      4 ( 0.00%,100.00%) [221]=      0 ( 0.00%,100.00%)
[ 14]=      0 ( 0.00%,  0.00%) [ 66]=      0 ( 0.00%,  0.00%) [118]=   9804 ( 0.03%,  0.06%) [170]=      8 ( 0.00%,100.00%) [222]=      0 ( 0.00%,100.00%)
[ 15]=      0 ( 0.00%,  0.00%) [ 67]=      0 ( 0.00%,  0.00%) [119]=  71240 ( 0.19%,  0.26%) [171]=      0 ( 0.00%,100.00%) [223]=      0 ( 0.00%,100.00%)
[ 16]=      0 ( 0.00%,  0.00%) [ 68]=      0 ( 0.00%,  0.00%) [120]= 598352 ( 1.63%,  1.88%) [172]=      8 ( 0.00%,100.00%) [224]=      0 ( 0.00%,100.00%)
[ 17]=      0 ( 0.00%,  0.00%) [ 69]=      0 ( 0.00%,  0.00%) [121]= 711304 ( 1.93%,  3.82%) [173]=     12 ( 0.00%,100.00%) [225]=      0 ( 0.00%,100.00%)
[ 18]=      0 ( 0.00%,  0.00%) [ 70]=      0 ( 0.00%,  0.00%) [122]= 286836 ( 0.78%,  4.59%) [174]=      0 ( 0.00%,100.00%) [226]=      0 ( 0.00%,100.00%)
[ 19]=      0 ( 0.00%,  0.00%) [ 71]=      0 ( 0.00%,  0.00%) [123]= 150904 ( 0.41%,  5.01%) [175]=      8 ( 0.00%,100.00%) [227]=      0 ( 0.00%,100.00%)
[ 20]=      0 ( 0.00%,  0.00%) [ 72]=      0 ( 0.00%,  0.00%) [124]= 128912 ( 0.35%,  5.36%) [176]=      0 ( 0.00%,100.00%) [228]=      0 ( 0.00%,100.00%)
[ 21]=      0 ( 0.00%,  0.00%) [ 73]=      0 ( 0.00%,  0.00%) [125]= 117384 ( 0.32%,  5.67%) [177]=      4 ( 0.00%,100.00%) [229]=      0 ( 0.00%,100.00%)
[ 22]=      0 ( 0.00%,  0.00%) [ 74]=      0 ( 0.00%,  0.00%) [126]= 147360 ( 0.40%,  6.07%) [178]=      0 ( 0.00%,100.00%) [230]=      0 ( 0.00%,100.00%)
[ 23]=      0 ( 0.00%,  0.00%) [ 75]=      0 ( 0.00%,  0.00%) [127]= 465884 ( 1.27%,  7.34%) [179]=      0 ( 0.00%,100.00%) [231]=      0 ( 0.00%,100.00%)
[ 24]=      0 ( 0.00%,  0.00%) [ 76]=      0 ( 0.00%,  0.00%) [128]=1309984 ( 3.56%, 10.90%) [180]=     12 ( 0.00%,100.00%) [232]=      0 ( 0.00%,100.00%)
[ 25]=      0 ( 0.00%,  0.00%) [ 77]=      0 ( 0.00%,  0.00%) [129]=1368784 ( 3.72%, 14.62%) [181]=      0 ( 0.00%,100.00%) [233]=      0 ( 0.00%,100.00%)
[ 26]=      0 ( 0.00%,  0.00%) [ 78]=      0 ( 0.00%,  0.00%) [130]=1558684 ( 4.24%, 18.86%) [182]=      4 ( 0.00%,100.00%) [234]=      0 ( 0.00%,100.00%)
[ 27]=      0 ( 0.00%,  0.00%) [ 79]=      0 ( 0.00%,  0.00%) [131]=1396468 ( 3.80%, 22.65%) [183]=      4 ( 0.00%,100.00%) [235]=      0 ( 0.00%,100.00%)
[ 28]=      0 ( 0.00%,  0.00%) [ 80]=      0 ( 0.00%,  0.00%) [132]=1089352 ( 2.96%, 25.61%) [184]=      4 ( 0.00%,100.00%) [236]=      0 ( 0.00%,100.00%)
[ 29]=      0 ( 0.00%,  0.00%) [ 81]=      0 ( 0.00%,  0.00%) [133]=1297916 ( 3.53%, 29.14%) [185]=      4 ( 0.00%,100.00%) [237]=      0 ( 0.00%,100.00%)
[ 30]=      0 ( 0.00%,  0.00%) [ 82]=      0 ( 0.00%,  0.00%) [134]=1722168 ( 4.68%, 33.82%) [186]=      0 ( 0.00%,100.00%) [238]=      0 ( 0.00%,100.00%)
[ 31]=      0 ( 0.00%,  0.00%) [ 83]=      0 ( 0.00%,  0.00%) [135]=1366128 ( 3.71%, 37.53%) [187]=      0 ( 0.00%,100.00%) [239]=      0 ( 0.00%,100.00%)
[ 32]=      0 ( 0.00%,  0.00%) [ 84]=      0 ( 0.00%,  0.00%) [136]=3036072 ( 8.25%, 45.79%) [188]=      0 ( 0.00%,100.00%) [240]=      0 ( 0.00%,100.00%)
[ 33]=      0 ( 0.00%,  0.00%) [ 85]=      0 ( 0.00%,  0.00%) [137]=3528260 ( 9.59%, 55.37%) [189]=      0 ( 0.00%,100.00%) [241]=      0 ( 0.00%,100.00%)
[ 34]=      0 ( 0.00%,  0.00%) [ 86]=      0 ( 0.00%,  0.00%) [138]=4291804 (11.66%, 67.04%) [190]=      0 ( 0.00%,100.00%) [242]=      0 ( 0.00%,100.00%)
[ 35]=      0 ( 0.00%,  0.00%) [ 87]=      0 ( 0.00%,  0.00%) [139]=2867932 ( 7.79%, 74.83%) [191]=      4 ( 0.00%,100.00%) [243]=      0 ( 0.00%,100.00%)
[ 36]=      0 ( 0.00%,  0.00%) [ 88]=      0 ( 0.00%,  0.00%) [140]=2315068 ( 6.29%, 81.12%) [192]=      0 ( 0.00%,100.00%) [244]=      0 ( 0.00%,100.00%)
[ 37]=      0 ( 0.00%,  0.00%) [ 89]=      0 ( 0.00%,  0.00%) [141]=2202584 ( 5.99%, 87.11%) [193]=      0 ( 0.00%,100.00%) [245]=      0 ( 0.00%,100.00%)
[ 38]=      0 ( 0.00%,  0.00%) [ 90]=      0 ( 0.00%,  0.00%) [142]= 943936 ( 2.57%, 89.68%) [194]=      0 ( 0.00%,100.00%) [246]=      0 ( 0.00%,100.00%)
[ 39]=      0 ( 0.00%,  0.00%) [ 91]=      0 ( 0.00%,  0.00%) [143]= 954184 ( 2.59%, 92.27%) [195]=      0 ( 0.00%,100.00%) [247]=      0 ( 0.00%,100.00%)
[ 40]=      0 ( 0.00%,  0.00%) [ 92]=      0 ( 0.00%,  0.00%) [144]= 839036 ( 2.28%, 94.55%) [196]=      0 ( 0.00%,100.00%) [248]=      0 ( 0.00%,100.00%)
[ 41]=      0 ( 0.00%,  0.00%) [ 93]=      0 ( 0.00%,  0.00%) [145]= 654088 ( 1.78%, 96.33%) [197]=      0 ( 0.00%,100.00%) [249]=      0 ( 0.00%,100.00%)
[ 42]=      0 ( 0.00%,  0.00%) [ 94]=      0 ( 0.00%,  0.00%) [146]= 488228 ( 1.33%, 97.65%) [198]=      0 ( 0.00%,100.00%) [250]=      0 ( 0.00%,100.00%)
[ 43]=      0 ( 0.00%,  0.00%) [ 95]=      0 ( 0.00%,  0.00%) [147]= 274592 ( 0.75%, 98.40%) [199]=      0 ( 0.00%,100.00%) [251]=      0 ( 0.00%,100.00%)
[ 44]=      0 ( 0.00%,  0.00%) [ 96]=      0 ( 0.00%,  0.00%) [148]= 148768 ( 0.40%, 98.81%) [200]=      4 ( 0.00%,100.00%) [252]=      0 ( 0.00%,100.00%)
[ 45]=      0 ( 0.00%,  0.00%) [ 97]=      0 ( 0.00%,  0.00%) [149]= 186980 ( 0.51%, 99.31%) [201]=      0 ( 0.00%,100.00%) [253]=      0 ( 0.00%,100.00%)
[ 46]=      0 ( 0.00%,  0.00%) [ 98]=      0 ( 0.00%,  0.00%) [150]= 122220 ( 0.33%, 99.65%) [202]=      0 ( 0.00%,100.00%) [254]=      0 ( 0.00%,100.00%)
[ 47]=      0 ( 0.00%,  0.00%) [ 99]=      0 ( 0.00%,  0.00%) [151]=  71816 ( 0.20%, 99.84%) [203]=      4 ( 0.00%,100.00%) [255]=      0 ( 0.00%,100.00%)
[ 48]=      0 ( 0.00%,  0.00%) [100]=      0 ( 0.00%,  0.00%) [152]=  31488 ( 0.09%, 99.93%) [204]=      0 ( 0.00%,100.00%)
[ 49]=      0 ( 0.00%,  0.00%) [101]=      0 ( 0.00%,  0.00%) [153]=  15052 ( 0.04%, 99.97%) [205]=      0 ( 0.00%,100.00%)
[ 50]=      0 ( 0.00%,  0.00%) [102]=      0 ( 0.00%,  0.00%) [154]=   6860 ( 0.02%, 99.99%) [206]=      0 ( 0.00%,100.00%)
[ 51]=      0 ( 0.00%,  0.00%) [103]=      0 ( 0.00%,  0.00%) [155]=   2056 ( 0.01%, 99.99%) [207]=      0 ( 0.00%,100.00%)
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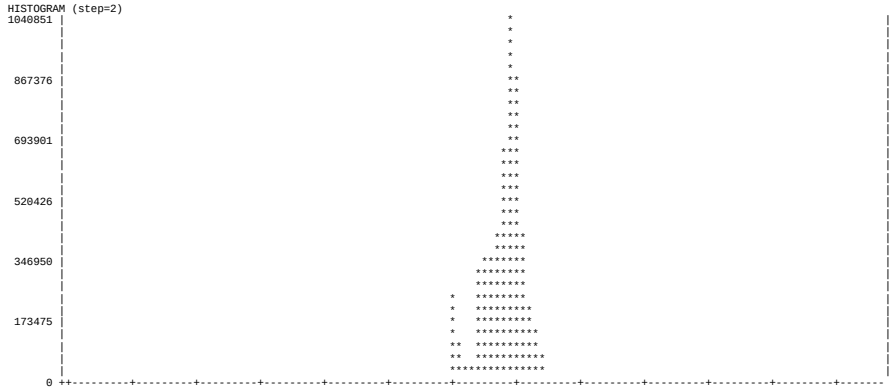
USGS – Channel 6L (THERMAL)

```
FILE dec.7

TOTAL NUMBER OF PIXELS =    14731691
IMAGE PIXELS           =     9734414 (66.08%)
BACKGROUND PIXELS      =     4997277 (33.92%)
MINIMUM                =         110
MAXIMUM                =         203
LEFT  BOUND 2%         =         121
RIGHT BOUND 2%         =         148
MEAN                   =     136.557
VARIANCE               =      35.679
STANDARD DEVIATION     =       5.973
```

HISTOGRAM (step=2)




```
[  0]=      0 ( 0.00%,  0.00%)  [ 52]=      0 ( 0.00%,  0.00%)  [104]=      0 ( 0.00%,  0.00%)  [156]=    707 ( 0.01%,100.00%)  [208]=      0 ( 0.00%,100.00%)
[  1]=      0 ( 0.00%,  0.00%)  [ 53]=      0 ( 0.00%,  0.00%)  [105]=      0 ( 0.00%,  0.00%)  [157]=    184 ( 0.00%,100.00%)  [209]=      0 ( 0.00%,100.00%)
[  2]=      0 ( 0.00%,  0.00%)  [ 54]=      0 ( 0.00%,  0.00%)  [106]=      0 ( 0.00%,  0.00%)  [158]=    102 ( 0.00%,100.00%)  [210]=      0 ( 0.00%,100.00%)
[  3]=      0 ( 0.00%,  0.00%)  [ 55]=      0 ( 0.00%,  0.00%)  [107]=      0 ( 0.00%,  0.00%)  [159]=     45 ( 0.00%,100.00%)  [211]=      0 ( 0.00%,100.00%)
[  4]=      0 ( 0.00%,  0.00%)  [ 56]=      0 ( 0.00%,  0.00%)  [108]=      0 ( 0.00%,  0.00%)  [160]=     19 ( 0.00%,100.00%)  [212]=      0 ( 0.00%,100.00%)
[  5]=      0 ( 0.00%,  0.00%)  [ 57]=      0 ( 0.00%,  0.00%)  [109]=      0 ( 0.00%,  0.00%)  [161]=      3 ( 0.00%,100.00%)  [213]=      0 ( 0.00%,100.00%)
[  6]=      0 ( 0.00%,  0.00%)  [ 58]=      0 ( 0.00%,  0.00%)  [110]=      1 ( 0.00%,  0.00%)  [162]=      2 ( 0.00%,100.00%)  [214]=      0 ( 0.00%,100.00%)
[  7]=      0 ( 0.00%,  0.00%)  [ 59]=      0 ( 0.00%,  0.00%)  [111]=      0 ( 0.00%,  0.00%)  [163]=      4 ( 0.00%,100.00%)  [215]=      0 ( 0.00%,100.00%)
[  8]=      0 ( 0.00%,  0.00%)  [ 60]=      0 ( 0.00%,  0.00%)  [112]=      0 ( 0.00%,  0.00%)  [164]=      6 ( 0.00%,100.00%)  [216]=      0 ( 0.00%,100.00%)
[  9]=      0 ( 0.00%,  0.00%)  [ 61]=      0 ( 0.00%,  0.00%)  [113]=      0 ( 0.00%,  0.00%)  [165]=      2 ( 0.00%,100.00%)  [217]=      0 ( 0.00%,100.00%)
[ 10]=      0 ( 0.00%,  0.00%)  [ 62]=      0 ( 0.00%,  0.00%)  [114]=     13 ( 0.00%,  0.00%)  [166]=      6 ( 0.00%,100.00%)  [218]=      0 ( 0.00%,100.00%)
[ 11]=      0 ( 0.00%,  0.00%)  [ 63]=      0 ( 0.00%,  0.00%)  [115]=    164 ( 0.00%,  0.00%)  [167]=      3 ( 0.00%,100.00%)  [219]=      0 ( 0.00%,100.00%)
[ 12]=      0 ( 0.00%,  0.00%)  [ 64]=      0 ( 0.00%,  0.00%)  [116]=    454 ( 0.00%,  0.01%)  [168]=      3 ( 0.00%,100.00%)  [220]=      0 ( 0.00%,100.00%)
[ 13]=      0 ( 0.00%,  0.00%)  [ 65]=      0 ( 0.00%,  0.00%)  [117]=   1218 ( 0.01%,  0.02%)  [169]=      2 ( 0.00%,100.00%)  [221]=      0 ( 0.00%,100.00%)
[ 14]=      0 ( 0.00%,  0.00%)  [ 66]=      0 ( 0.00%,  0.00%)  [118]=   1674 ( 0.02%,  0.04%)  [170]=      2 ( 0.00%,100.00%)  [222]=      0 ( 0.00%,100.00%)
[ 15]=      0 ( 0.00%,  0.00%)  [ 67]=      0 ( 0.00%,  0.00%)  [119]=   2604 ( 0.03%,  0.06%)  [171]=      0 ( 0.00%,100.00%)  [223]=      0 ( 0.00%,100.00%)
[ 16]=      0 ( 0.00%,  0.00%)  [ 68]=      0 ( 0.00%,  0.00%)  [120]=  44178 ( 0.45%,  0.52%)  [172]=      0 ( 0.00%,100.00%)  [224]=      0 ( 0.00%,100.00%)
[ 17]=      0 ( 0.00%,  0.00%)  [ 69]=      0 ( 0.00%,  0.00%)  [121]= 258344 ( 2.65%,  3.17%)  [173]=      3 ( 0.00%,100.00%)  [225]=      0 ( 0.00%,100.00%)
[ 18]=      0 ( 0.00%,  0.00%)  [ 70]=      0 ( 0.00%,  0.00%)  [122]= 122689 ( 1.26%,  4.43%)  [174]=      2 ( 0.00%,100.00%)  [226]=      0 ( 0.00%,100.00%)
[ 19]=      0 ( 0.00%,  0.00%)  [ 71]=      0 ( 0.00%,  0.00%)  [123]=  45617 ( 0.47%,  4.90%)  [175]=      2 ( 0.00%,100.00%)  [227]=      0 ( 0.00%,100.00%)
[ 20]=      0 ( 0.00%,  0.00%)  [ 72]=      0 ( 0.00%,  0.00%)  [124]=  35926 ( 0.37%,  5.27%)  [176]=      0 ( 0.00%,100.00%)  [228]=      0 ( 0.00%,100.00%)
[ 21]=      0 ( 0.00%,  0.00%)  [ 73]=      0 ( 0.00%,  0.00%)  [125]=  26461 ( 0.27%,  5.54%)  [177]=      1 ( 0.00%,100.00%)  [229]=      0 ( 0.00%,100.00%)
[ 22]=      0 ( 0.00%,  0.00%)  [ 74]=      0 ( 0.00%,  0.00%)  [126]=  32434 ( 0.33%,  5.87%)  [178]=      0 ( 0.00%,100.00%)  [230]=      0 ( 0.00%,100.00%)
[ 23]=      0 ( 0.00%,  0.00%)  [ 75]=      0 ( 0.00%,  0.00%)  [127]=  66194 ( 0.68%,  6.55%)  [179]=      0 ( 0.00%,100.00%)  [231]=      0 ( 0.00%,100.00%)
[ 24]=      0 ( 0.00%,  0.00%)  [ 76]=      0 ( 0.00%,  0.00%)  [128]= 193022 ( 1.98%,  8.54%)  [180]=      2 ( 0.00%,100.00%)  [232]=      0 ( 0.00%,100.00%)
[ 25]=      0 ( 0.00%,  0.00%)  [ 77]=      0 ( 0.00%,  0.00%)  [129]= 346131 ( 3.56%, 12.09%)  [181]=      0 ( 0.00%,100.00%)  [233]=      0 ( 0.00%,100.00%)
[ 26]=      0 ( 0.00%,  0.00%)  [ 78]=      0 ( 0.00%,  0.00%)  [130]= 370463 ( 3.81%, 15.90%)  [182]=      0 ( 0.00%,100.00%)  [234]=      0 ( 0.00%,100.00%)
[ 27]=      0 ( 0.00%,  0.00%)  [ 79]=      0 ( 0.00%,  0.00%)  [131]= 375635 ( 3.86%, 19.76%)  [183]=      1 ( 0.00%,100.00%)  [235]=      0 ( 0.00%,100.00%)
[ 28]=      0 ( 0.00%,  0.00%)  [ 80]=      0 ( 0.00%,  0.00%)  [132]= 369658 ( 3.80%, 23.55%)  [184]=      1 ( 0.00%,100.00%)  [236]=      0 ( 0.00%,100.00%)
[ 29]=      0 ( 0.00%,  0.00%)  [ 81]=      0 ( 0.00%,  0.00%)  [133]= 302296 ( 3.11%, 26.66%)  [185]=      2 ( 0.00%,100.00%)  [237]=      0 ( 0.00%,100.00%)
[ 30]=      0 ( 0.00%,  0.00%)  [ 82]=      0 ( 0.00%,  0.00%)  [134]= 363574 ( 3.73%, 30.39%)  [186]=      0 ( 0.00%,100.00%)  [238]=      0 ( 0.00%,100.00%)
[ 31]=      0 ( 0.00%,  0.00%)  [ 83]=      0 ( 0.00%,  0.00%)  [135]= 431773 ( 4.44%, 34.83%)  [187]=      0 ( 0.00%,100.00%)  [239]=      0 ( 0.00%,100.00%)
[ 32]=      0 ( 0.00%,  0.00%)  [ 84]=      0 ( 0.00%,  0.00%)  [136]= 607073 ( 6.24%, 41.07%)  [188]=      0 ( 0.00%,100.00%)  [240]=      0 ( 0.00%,100.00%)
[ 33]=      0 ( 0.00%,  0.00%)  [ 85]=      0 ( 0.00%,  0.00%)  [137]= 684291 ( 7.03%, 48.10%)  [189]=      0 ( 0.00%,100.00%)  [241]=      0 ( 0.00%,100.00%)
[ 34]=      0 ( 0.00%,  0.00%)  [ 86]=      0 ( 0.00%,  0.00%)  [138]= 938652 ( 9.64%, 57.74%)  [190]=      0 ( 0.00%,100.00%)  [242]=      0 ( 0.00%,100.00%)
[ 35]=      0 ( 0.00%,  0.00%)  [ 87]=      0 ( 0.00%,  0.00%)  [139]=1040851 (10.69%, 68.43%)  [191]=      0 ( 0.00%,100.00%)  [243]=      0 ( 0.00%,100.00%)
[ 36]=      0 ( 0.00%,  0.00%)  [ 88]=      0 ( 0.00%,  0.00%)  [140]= 885960 ( 9.10%, 77.53%)  [192]=      1 ( 0.00%,100.00%)  [244]=      0 ( 0.00%,100.00%)
[ 37]=      0 ( 0.00%,  0.00%)  [ 89]=      0 ( 0.00%,  0.00%)  [141]= 642576 ( 6.60%, 84.13%)  [193]=      0 ( 0.00%,100.00%)  [245]=      0 ( 0.00%,100.00%)
[ 38]=      0 ( 0.00%,  0.00%)  [ 90]=      0 ( 0.00%,  0.00%)  [142]= 443929 ( 4.56%, 88.69%)  [194]=      0 ( 0.00%,100.00%)  [246]=      0 ( 0.00%,100.00%)
[ 39]=      0 ( 0.00%,  0.00%)  [ 91]=      0 ( 0.00%,  0.00%)  [143]= 216495 ( 2.22%, 90.92%)  [195]=      0 ( 0.00%,100.00%)  [247]=      0 ( 0.00%,100.00%)
[ 40]=      0 ( 0.00%,  0.00%)  [ 92]=      0 ( 0.00%,  0.00%)  [144]= 221406 ( 2.27%, 93.19%)  [196]=      0 ( 0.00%,100.00%)  [248]=      0 ( 0.00%,100.00%)
[ 41]=      0 ( 0.00%,  0.00%)  [ 93]=      0 ( 0.00%,  0.00%)  [145]= 182381 ( 1.87%, 95.07%)  [197]=      0 ( 0.00%,100.00%)  [249]=      0 ( 0.00%,100.00%)
[ 42]=      0 ( 0.00%,  0.00%)  [ 94]=      0 ( 0.00%,  0.00%)  [146]= 151286 ( 1.55%, 96.62%)  [198]=      0 ( 0.00%,100.00%)  [250]=      0 ( 0.00%,100.00%)
[ 43]=      0 ( 0.00%,  0.00%)  [ 95]=      0 ( 0.00%,  0.00%)  [147]= 103964 ( 1.07%, 97.69%)  [199]=      0 ( 0.00%,100.00%)  [251]=      0 ( 0.00%,100.00%)
[ 44]=      0 ( 0.00%,  0.00%)  [ 96]=      0 ( 0.00%,  0.00%)  [148]=  93532 ( 0.96%, 98.65%)  [200]=      0 ( 0.00%,100.00%)  [252]=      0 ( 0.00%,100.00%)
[ 45]=      0 ( 0.00%,  0.00%)  [ 97]=      0 ( 0.00%,  0.00%)  [149]=  62075 ( 0.64%, 99.29%)  [201]=      1 ( 0.00%,100.00%)  [253]=      0 ( 0.00%,100.00%)
[ 46]=      0 ( 0.00%,  0.00%)  [ 98]=      0 ( 0.00%,  0.00%)  [150]=  28573 ( 0.29%, 99.58%)  [202]=      0 ( 0.00%,100.00%)  [254]=      0 ( 0.00%,100.00%)
[ 47]=      0 ( 0.00%,  0.00%)  [ 99]=      0 ( 0.00%,  0.00%)  [151]=  17163 ( 0.18%, 99.76%)  [203]=      1 ( 0.00%,100.00%)  [255]=      0 ( 0.00%,100.00%)
[ 48]=      0 ( 0.00%,  0.00%)  [100]=      0 ( 0.00%,  0.00%)  [152]=  11658 ( 0.12%, 99.88%)  [204]=      0 ( 0.00%,100.00%)
[ 49]=      0 ( 0.00%,  0.00%)  [101]=      0 ( 0.00%,  0.00%)  [153]=   6034 ( 0.06%, 99.94%)  [205]=      0 ( 0.00%,100.00%)
[ 50]=      0 ( 0.00%,  0.00%)  [102]=      0 ( 0.00%,  0.00%)  [154]=   3022 ( 0.03%, 99.97%)  [206]=      0 ( 0.00%,100.00%)
[ 51]=      0 ( 0.00%,  0.00%)  [103]=      0 ( 0.00%,  0.00%)  [155]=   1863 ( 0.02%, 99.99%)  [207]=      0 ( 0.00%,100.00%)
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ESA – Channel 6H (THERMAL)

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FILE dec.8

TOTAL NUMBER OF PIXELS =    51577456
IMAGE PIXELS           =    36794756 (71.34%)
BACKGROUND PIXELS      =    14782700 (28.66%)
MINIMUM                =         118
MAXIMUM                =         255
LEFT  BOUND 2%         =         131
RIGHT BOUND 2%         =         179
MEAN                   =     158.820
VARIANCE               =     115.462
STANDARD DEVIATION     =      10.745
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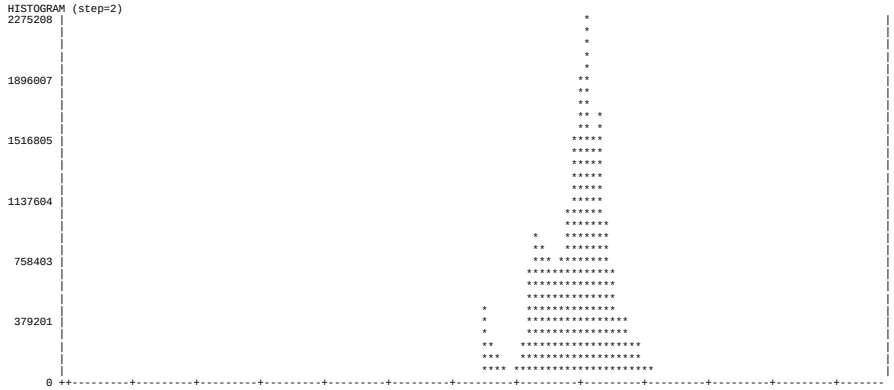
HISTOGRAM (step=2)



[0]=	0 (0.00%, 0.00%)	[52]=	0 (0.00%, 0.00%)	[104]=	0 (0.00%, 0.00%)	[156]=	932600 (2.53%, 33.74%)	[208]=	8 (0.00%,100.00%)
[1]=	0 (0.00%, 0.00%)	[53]=	0 (0.00%, 0.00%)	[105]=	0 (0.00%, 0.00%)	[157]=1095672 (2.98%, 36.72%)	[209]=	16 (0.00%,100.00%)
[2]=	0 (0.00%, 0.00%)	[54]=	0 (0.00%, 0.00%)	[106]=	0 (0.00%, 0.00%)	[158]=1137448 (3.09%, 39.81%)	[210]=	8 (0.00%,100.00%)
[3]=	0 (0.00%, 0.00%)	[55]=	0 (0.00%, 0.00%)	[107]=	0 (0.00%, 0.00%)	[159]=1581288 (4.30%, 44.11%)	[211]=	8 (0.00%,100.00%)
[4]=	0 (0.00%, 0.00%)	[56]=	0 (0.00%, 0.00%)	[108]=	0 (0.00%, 0.00%)	[160]=1951036 (5.30%, 49.41%)	[212]=	4 (0.00%,100.00%)
[5]=	0 (0.00%, 0.00%)	[57]=	0 (0.00%, 0.00%)	[109]=	0 (0.00%, 0.00%)	[161]=1866400 (5.07%, 54.48%)	[213]=	12 (0.00%,100.00%)
[6]=	0 (0.00%, 0.00%)	[58]=	0 (0.00%, 0.00%)	[110]=	0 (0.00%, 0.00%)	[162]=2275208 (6.18%, 60.67%)	[214]=	4 (0.00%,100.00%)
[7]=	0 (0.00%, 0.00%)	[59]=	0 (0.00%, 0.00%)	[111]=	0 (0.00%, 0.00%)	[163]=2173500 (5.91%, 66.57%)	[215]=	12 (0.00%,100.00%)
[8]=	0 (0.00%, 0.00%)	[60]=	0 (0.00%, 0.00%)	[112]=	0 (0.00%, 0.00%)	[164]=1534292 (4.17%, 70.74%)	[216]=	8 (0.00%,100.00%)
[9]=	0 (0.00%, 0.00%)	[61]=	0 (0.00%, 0.00%)	[113]=	0 (0.00%, 0.00%)	[165]=1401000 (3.81%, 74.55%)	[217]=	4 (0.00%,100.00%)
[10]=	0 (0.00%, 0.00%)	[62]=	0 (0.00%, 0.00%)	[114]=	0 (0.00%, 0.00%)	[166]=1677924 (4.56%, 79.11%)	[218]=	4 (0.00%,100.00%)
[11]=	0 (0.00%, 0.00%)	[63]=	0 (0.00%, 0.00%)	[115]=	0 (0.00%, 0.00%)	[167]=1373444 (3.73%, 82.84%)	[219]=	0 (0.00%,100.00%)
[12]=	0 (0.00%, 0.00%)	[64]=	0 (0.00%, 0.00%)	[116]=	0 (0.00%, 0.00%)	[168]=1000700 (2.72%, 85.56%)	[220]=	4 (0.00%,100.00%)
[13]=	0 (0.00%, 0.00%)	[65]=	0 (0.00%, 0.00%)	[117]=	0 (0.00%, 0.00%)	[169]= 810080 (2.20%, 87.77%)	[221]=	0 (0.00%,100.00%)
[14]=	0 (0.00%, 0.00%)	[66]=	0 (0.00%, 0.00%)	[118]=	16 (0.00%, 0.00%)	[170]= 736272 (2.00%, 89.77%)	[222]=	4 (0.00%,100.00%)
[15]=	0 (0.00%, 0.00%)	[67]=	0 (0.00%, 0.00%)	[119]=	68 (0.00%, 0.00%)	[171]= 521140 (1.42%, 91.18%)	[223]=	4 (0.00%,100.00%)
[16]=	0 (0.00%, 0.00%)	[68]=	0 (0.00%, 0.00%)	[120]=	180 (0.00%, 0.00%)	[172]= 453992 (1.23%, 92.42%)	[224]=	0 (0.00%,100.00%)
[17]=	0 (0.00%, 0.00%)	[69]=	0 (0.00%, 0.00%)	[121]=	844 (0.00%, 0.00%)	[173]= 441720 (1.20%, 93.62%)	[225]=	8 (0.00%,100.00%)
[18]=	0 (0.00%, 0.00%)	[70]=	0 (0.00%, 0.00%)	[122]=	1564 (0.00%, 0.01%)	[174]= 389020 (1.06%, 94.67%)	[226]=	0 (0.00%,100.00%)
[19]=	0 (0.00%, 0.00%)	[71]=	0 (0.00%, 0.00%)	[123]=	2572 (0.01%, 0.01%)	[175]= 347372 (0.94%, 95.62%)	[227]=	8 (0.00%,100.00%)
[20]=	0 (0.00%, 0.00%)	[72]=	0 (0.00%, 0.00%)	[124]=	3300 (0.01%, 0.02%)	[176]= 269516 (0.73%, 96.35%)	[228]=	4 (0.00%,100.00%)
[21]=	0 (0.00%, 0.00%)	[73]=	0 (0.00%, 0.00%)	[125]=	3452 (0.01%, 0.03%)	[177]= 238316 (0.65%, 97.00%)	[229]=	4 (0.00%,100.00%)
[22]=	0 (0.00%, 0.00%)	[74]=	0 (0.00%, 0.00%)	[126]=	4852 (0.01%, 0.05%)	[178]= 229180 (0.62%, 97.62%)	[230]=	0 (0.00%,100.00%)
[23]=	0 (0.00%, 0.00%)	[75]=	0 (0.00%, 0.00%)	[127]=	5992 (0.02%, 0.06%)	[179]= 200068 (0.54%, 98.17%)	[231]=	0 (0.00%,100.00%)
[24]=	0 (0.00%, 0.00%)	[76]=	0 (0.00%, 0.00%)	[128]= 7524 (0.02%, 0.08%)	[180]= 143716 (0.39%, 98.56%)	[232]=	0 (0.00%,100.00%)
[25]=	0 (0.00%, 0.00%)	[77]=	0 (0.00%, 0.00%)	[129]= 60328 (0.16%, 0.25%)	[181]= 121156 (0.33%, 98.88%)	[233]=	4 (0.00%,100.00%)
[26]=	0 (0.00%, 0.00%)	[78]=	0 (0.00%, 0.00%)	[130]= 442000 (1.20%, 1.45%)	[182]= 112504 (0.31%, 99.19%)	[234]=	0 (0.00%,100.00%)
[27]=	0 (0.00%, 0.00%)	[79]=	0 (0.00%, 0.00%)	[131]= 487976 (1.33%, 2.77%)	[183]= 90352 (0.25%, 99.44%)	[235]=	0 (0.00%,100.00%)
[28]=	0 (0.00%, 0.00%)	[80]=	0 (0.00%, 0.00%)	[132]= 290552 (0.79%, 3.56%)	[184]= 58700 (0.16%, 99.60%)	[236]=	0 (0.00%,100.00%)
[29]=	0 (0.00%, 0.00%)	[81]=	0 (0.00%, 0.00%)	[133]= 206896 (0.56%, 4.13%)	[185]= 48856 (0.13%, 99.73%)	[237]=	0 (0.00%,100.00%)
[30]=	0 (0.00%, 0.00%)	[82]=	0 (0.00%, 0.00%)	[134]= 152176 (0.41%, 4.54%)	[186]= 34284 (0.09%, 99.82%)	[238]=	8 (0.00%,100.00%)
[31]=	0 (0.00%, 0.00%)	[83]=	0 (0.00%, 0.00%)	[135]= 117520 (0.32%, 4.86%)	[187]= 17404 (0.05%, 99.87%)	[239]=	4 (0.00%,100.00%)
[32]=	0 (0.00%, 0.00%)	[84]=	0 (0.00%, 0.00%)	[136]= 80096 (0.22%, 5.08%)	[188]= 12216 (0.03%, 99.90%)	[240]=	0 (0.00%,100.00%)
[33]=	0 (0.00%, 0.00%)	[85]=	0 (0.00%, 0.00%)	[137]= 62840 (0.17%, 5.25%)	[189]= 11484 (0.03%, 99.93%)	[241]=	0 (0.00%,100.00%)
[34]=	0 (0.00%, 0.00%)	[86]=	0 (0.00%, 0.00%)	[138]= 62616 (0.17%, 5.42%)	[190]= 8336 (0.02%, 99.96%)	[242]=	4 (0.00%,100.00%)
[35]=	0 (0.00%, 0.00%)	[87]=	0 (0.00%, 0.00%)	[139]= 58376 (0.16%, 5.58%)	[191]= 5084 (0.01%, 99.97%)	[243]=	0 (0.00%,100.00%)
[36]=	0 (0.00%, 0.00%)	[88]=	0 (0.00%, 0.00%)	[140]= 74664 (0.20%, 5.78%)	[192]= 3932 (0.01%, 99.98%)	[244]=	0 (0.00%,100.00%)
[37]=	0 (0.00%, 0.00%)	[89]=	0 (0.00%, 0.00%)	[141]= 106164 (0.29%, 6.07%)	[193]= 2976 (0.01%, 99.99%)	[245]=	4 (0.00%,100.00%)
[38]=	0 (0.00%, 0.00%)	[90]=	0 (0.00%, 0.00%)	[142]= 92336 (0.25%, 6.32%)	[194]= 1780 (0.00%, 99.99%)	[246]=	4 (0.00%,100.00%)
[39]=	0 (0.00%, 0.00%)	[91]=	0 (0.00%, 0.00%)	[143]= 237724 (0.65%, 6.97%)	[195]= 868 (0.00%,100.00%)	[247]=	0 (0.00%,100.00%)
[40]=	0 (0.00%, 0.00%)	[92]=	0 (0.00%, 0.00%)	[144]= 413312 (1.12%, 8.09%)	[196]= 492 (0.00%,100.00%)	[248]=	4 (0.00%,100.00%)
[41]=	0 (0.00%, 0.00%)	[93]=	0 (0.00%, 0.00%)	[145]= 728748 (1.98%, 10.07%)	[197]= 324 (0.00%,100.00%)	[249]=	0 (0.00%,100.00%)
[42]=	0 (0.00%, 0.00%)	[94]=	0 (0.00%, 0.00%)	[146]= 905040 (2.46%, 12.53%)	[198]= 224 (0.00%,100.00%)	[250]=	0 (0.00%,100.00%)
[43]=	0 (0.00%, 0.00%)	[95]=	0 (0.00%, 0.00%)	[147]= 964884 (2.62%, 15.15%)	[199]= 100 (0.00%,100.00%)	[251]=	0 (0.00%,100.00%)
[44]=	0 (0.00%, 0.00%)	[96]=	0 (0.00%, 0.00%)	[148]= 807416 (2.19%, 17.35%)	[200]= 84 (0.00%,100.00%)	[252]=	0 (0.00%,100.00%)
[45]=	0 (0.00%, 0.00%)	[97]=	0 (0.00%, 0.00%)	[149]= 861680 (2.34%, 19.69%)	[201]= 28 (0.00%,100.00%)	[253]=	0 (0.00%,100.00%)
[46]=	0 (0.00%, 0.00%)	[98]=	0 (0.00%, 0.00%)	[150]= 806160 (2.19%, 21.88%)	[202]= 24 (0.00%,100.00%)	[254]=	0 (0.00%,100.00%)
[47]=	0 (0.00%, 0.00%)	[99]=	0 (0.00%, 0.00%)	[151]= 763552 (2.08%, 23.96%)	[203]= 24 (0.00%,100.00%)	[255]=	12 (0.00%,100.00%)
[48]=	0 (0.00%, 0.00%)	[100]=	0 (0.00%, 0.00%)	[152]= 644644 (1.75%, 25.71%)	[204]= 0 (0.00%,100.00%)		
[49]=	0 (0.00%, 0.00%)	[101]=	0 (0.00%, 0.00%)	[153]= 741964 (2.02%, 27.72%)	[205]= 16 (0.00%,100.00%)		
[50]=	0 (0.00%, 0.00%)	[102]=	0 (0.00%, 0.00%)	[154]= 477416 (1.30%, 29.02%)	[206]= 4 (0.00%,100.00%)		
[51]=	0 (0.00%, 0.00%)	[103]=	0 (0.00%, 0.00%)	[155]= 804184 (2.19%, 31.21%)	[207]= 4 (0.00%,100.00%)		

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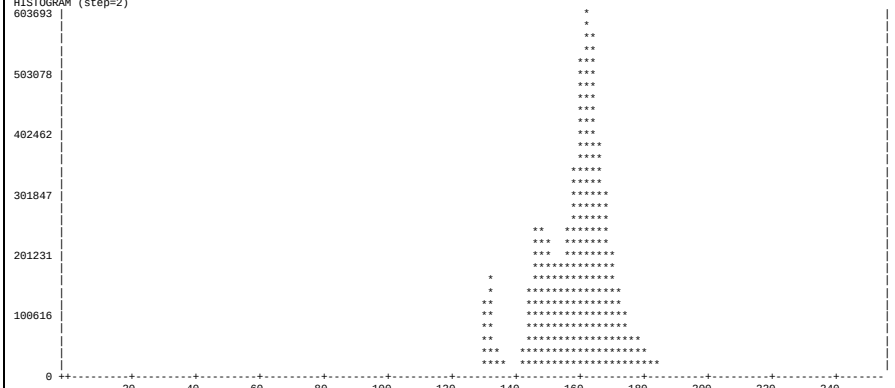
USGS – Channel 6H (THERMAL)

FILE dec.8

TOTAL NUMBER OF PIXELS	=	14731691
IMAGE PIXELS	=	9734414 (66.08%)
BACKGROUND PIXELS	=	4997277 (33.92%)
MINIMUM	=	111
MAXIMUM	=	255
LEFT BOUND 2%	=	132
RIGHT BOUND 2%	=	180
MEAN	=	159.438
VARIANCE	=	114.635
STANDARD DEVIATION	=	10.707

HISTOGRAM (step=2)



[0]=	0 (0.00%,	0.00%)	[52]=	0 (0.00%,	0.00%)	[104]=	0 (0.00%,	0.00%)	[156]=223815 (2.30%,	32.07%)	[208]=	1 (0.00%,100.00%)
[1]=	0 (0.00%,	0.00%)	[53]=	0 (0.00%,	0.00%)	[105]=	0 (0.00%,	0.00%)	[157]=260459 (2.68%,	34.74%)	[209]=	3 (0.00%,100.00%)
[2]=	0 (0.00%,	0.00%)	[54]=	0 (0.00%,	0.00%)	[106]=	0 (0.00%,	0.00%)	[158]=209019 (2.15%,	36.89%)	[210]=	3 (0.00%,100.00%)
[3]=	0 (0.00%,	0.00%)	[55]=	0 (0.00%,	0.00%)	[107]=	0 (0.00%,	0.00%)	[159]=361425 (3.71%,	40.60%)	[211]=	2 (0.00%,100.00%)
[4]=	0 (0.00%,	0.00%)	[56]=	0 (0.00%,	0.00%)	[108]=	0 (0.00%,	0.00%)	[160]=440081 (4.52%,	45.12%)	[212]=	2 (0.00%,100.00%)
[5]=	0 (0.00%,	0.00%)	[57]=	0 (0.00%,	0.00%)	[109]=	0 (0.00%,	0.00%)	[161]=534381 (5.49%,	50.61%)	[213]=	4 (0.00%,100.00%)
[6]=	0 (0.00%,	0.00%)	[58]=	0 (0.00%,	0.00%)	[110]=	0 (0.00%,	0.00%)	[162]=480711 (4.94%,	55.55%)	[214]=	1 (0.00%,100.00%)
[7]=	0 (0.00%,	0.00%)	[59]=	0 (0.00%,	0.00%)	[111]=	1 (0.00%,	0.00%)	[163]=603693 (6.20%,	61.75%)	[215]=	2 (0.00%,100.00%)
[8]=	0 (0.00%,	0.00%)	[60]=	0 (0.00%,	0.00%)	[112]=	0 (0.00%,	0.00%)	[164]=572743 (5.88%,	67.64%)	[216]=	2 (0.00%,100.00%)
[9]=	0 (0.00%,	0.00%)	[61]=	0 (0.00%,	0.00%)	[113]=	0 (0.00%,	0.00%)	[165]=529497 (5.44%,	73.08%)	[217]=	1 (0.00%,100.00%)
[10]=	0 (0.00%,	0.00%)	[62]=	0 (0.00%,	0.00%)	[114]=	0 (0.00%,	0.00%)	[166]=395991 (4.07%,	77.14%)	[218]=	1 (0.00%,100.00%)
[11]=	0 (0.00%,	0.00%)	[63]=	0 (0.00%,	0.00%)	[115]=	0 (0.00%,	0.00%)	[167]=397943 (4.09%,	81.23%)	[219]=	0 (0.00%,100.00%)
[12]=	0 (0.00%,	0.00%)	[64]=	0 (0.00%,	0.00%)	[116]=	0 (0.00%,	0.00%)	[168]=320198 (3.29%,	84.52%)	[220]=	1 (0.00%,100.00%)
[13]=	0 (0.00%,	0.00%)	[65]=	0 (0.00%,	0.00%)	[117]=	0 (0.00%,	0.00%)	[169]=215630 (2.22%,	86.74%)	[221]=	0 (0.00%,100.00%)
[14]=	0 (0.00%,	0.00%)	[66]=	0 (0.00%,	0.00%)	[118]=	0 (0.00%,	0.00%)	[170]=219373 (2.25%,	88.99%)	[222]=	1 (0.00%,100.00%)
[15]=	0 (0.00%,	0.00%)	[67]=	0 (0.00%,	0.00%)	[119]=	1 (0.00%,	0.00%)	[171]=174832 (1.80%,	90.79%)	[223]=	1 (0.00%,100.00%)
[16]=	0 (0.00%,	0.00%)	[68]=	0 (0.00%,	0.00%)	[120]=	11 (0.00%,	0.00%)	[172]=142304 (1.46%,	92.25%)	[224]=	0 (0.00%,100.00%)
[17]=	0 (0.00%,	0.00%)	[69]=	0 (0.00%,	0.00%)	[121]=	81 (0.00%,	0.00%)	[173]=100513 (1.03%,	93.28%)	[225]=	2 (0.00%,100.00%)
[18]=	0 (0.00%,	0.00%)	[70]=	0 (0.00%,	0.00%)	[122]=	289 (0.00%,	0.00%)	[174]=108864 (1.12%,	94.40%)	[226]=	0 (0.00%,100.00%)
[19]=	0 (0.00%,	0.00%)	[71]=	0 (0.00%,	0.00%)	[123]=	376 (0.00%,	0.01%)	[175]= 96804 (0.99%,	95.39%)	[227]=	2 (0.00%,100.00%)
[20]=	0 (0.00%,	0.00%)	[72]=	0 (0.00%,	0.00%)	[124]=	673 (0.01%,	0.01%)	[176]= 48831 (0.50%,	95.90%)	[228]=	1 (0.00%,100.00%)
[21]=	0 (0.00%,	0.00%)	[73]=	0 (0.00%,	0.00%)	[125]=	852 (0.01%,	0.02%)	[177]= 77489 (0.80%,	96.69%)	[229]=	1 (0.00%,100.00%)
[22]=	0 (0.00%,	0.00%)	[74]=	0 (0.00%,	0.00%)	[126]=	755 (0.01%,	0.03%)	[178]= 67050 (0.69%,	97.38%)	[230]=	0 (0.00%,100.00%)
[23]=	0 (0.00%,	0.00%)	[75]=	0 (0.00%,	0.00%)	[127]= 1205 (0.01%,	0.04%)	[179]= 56927 (0.58%,	97.97%)	[231]=	0 (0.00%,100.00%)
[24]=	0 (0.00%,	0.00%)	[76]=	0 (0.00%,	0.00%)	[128]= 1518 (0.02%,	0.06%)	[180]= 35964 (0.37%,	98.33%)	[232]=	0 (0.00%,100.00%)
[25]=	0 (0.00%,	0.00%)	[77]=	0 (0.00%,	0.00%)	[129]= 2726 (0.03%,	0.09%)	[181]= 42546 (0.44%,	98.77%)	[233]=	1 (0.00%,100.00%)
[26]=	0 (0.00%,	0.00%)	[78]=	0 (0.00%,	0.00%)	[130]= 18653 (0.19%,	0.28%)	[182]= 33328 (0.34%,	99.11%)	[234]=	0 (0.00%,100.00%)
[27]=	0 (0.00%,	0.00%)	[79]=	0 (0.00%,	0.00%)	[131]=128523 (1.32%,	1.60%)	[183]= 21082 (0.22%,	99.33%)	[235]=	0 (0.00%,100.00%)
[28]=	0 (0.00%,	0.00%)	[80]=	0 (0.00%,	0.00%)	[132]=170215 (1.75%,	3.35%)	[184]= 20577 (0.21%,	99.54%)	[236]=	0 (0.00%,100.00%)
[29]=	0 (0.00%,	0.00%)	[81]=	0 (0.00%,	0.00%)	[133]= 64232 (0.66%,	4.01%)	[185]= 14636 (0.15%,	99.69%)	[237]=	0 (0.00%,100.00%)
[30]=	0 (0.00%,	0.00%)	[82]=	0 (0.00%,	0.00%)	[134]= 46535 (0.48%,	4.49%)	[186]= 10383 (0.11%,	99.80%)	[238]=	1 (0.00%,100.00%)
[31]=	0 (0.00%,	0.00%)	[83]=	0 (0.00%,	0.00%)	[135]= 35974 (0.37%,	4.86%)	[187]= 5098 (0.05%,	99.85%)	[239]=	1 (0.00%,100.00%)
[32]=	0 (0.00%,	0.00%)	[84]=	0 (0.00%,	0.00%)	[136]= 25966 (0.27%,	5.12%)	[188]= 4661 (0.05%,	99.90%)	[240]=	0 (0.00%,100.00%)
[33]=	0 (0.00%,	0.00%)	[85]=	0 (0.00%,	0.00%)	[137]= 13140 (0.13%,	5.26%)	[189]= 3115 (0.03%,	99.93%)	[241]=	0 (0.00%,100.00%)
[34]=	0 (0.00%,	0.00%)	[86]=	0 (0.00%,	0.00%)	[138]= 16088 (0.17%,	5.42%)	[190]= 2267 (0.02%,	99.95%)	[242]=	1 (0.00%,100.00%)
[35]=	0 (0.00%,	0.00%)	[87]=	0 (0.00%,	0.00%)	[139]= 16020 (0.16%,	5.59%)	[191]= 1330 (0.01%,	99.97%)	[243]=	0 (0.00%,100.00%)
[36]=	0 (0.00%,	0.00%)	[88]=	0 (0.00%,	0.00%)	[140]= 17276 (0.18%,	5.76%)	[192]= 1180 (0.01%,	99.98%)	[244]=	0 (0.00%,100.00%)
[37]=	0 (0.00%,	0.00%)	[89]=	0 (0.00%,	0.00%)	[141]= 17216 (0.18%,	5.94%)	[193]= 780 (0.01%,	99.99%)	[245]=	1 (0.00%,100.00%)
[38]=	0 (0.00%,	0.00%)	[90]=	0 (0.00%,	0.00%)	[142]= 29282 (0.30%,	6.24%)	[194]= 385 (0.00%,	99.99%)	[246]=	1 (0.00%,100.00%)
[39]=	0 (0.00%,	0.00%)	[91]=	0 (0.00%,	0.00%)	[143]= 56851 (0.58%,	6.83%)	[195]= 274 (0.00%,100.00%)	[247]=	1 (0.00%,100.00%)
[40]=	0 (0.00%,	0.00%)	[92]=	0 (0.00%,	0.00%)	[144]= 69977 (0.72%,	7.54%)	[196]= 184 (0.00%,100.00%)	[248]=	0 (0.00%,100.00%)
[41]=	0 (0.00%,	0.00%)	[93]=	0 (0.00%,	0.00%)	[145]=160727 (1.65%,	9.20%)	[197]= 83 (0.00%,100.00%)	[249]=	0 (0.00%,100.00%)
[42]=	0 (0.00%,	0.00%)	[94]=	0 (0.00%,	0.00%)	[146]=224606 (2.31%,	11.50%)	[198]= 50 (0.00%,100.00%)	[250]=	0 (0.00%,100.00%)
[43]=	0 (0.00%,	0.00%)	[95]=	0 (0.00%,	0.00%)	[147]=246998 (2.54%,	14.04%)	[199]= 43 (0.00%,100.00%)	[251]=	0 (0.00%,100.00%)
[44]=	0 (0.00%,	0.00%)	[96]=	0 (0.00%,	0.00%)	[148]=138098 (1.42%,	15.46%)	[200]= 20 (0.00%,100.00%)	[252]=	0 (0.00%,100.00%)
[45]=	0 (0.00%,	0.00%)	[97]=	0 (0.00%,	0.00%)	[149]=244713 (2.51%,	17.97%)	[201]= 8 (0.00%,100.00%)	[253]=	0 (0.00%,100.00%)
[46]=	0 (0.00%,	0.00%)	[98]=	0 (0.00%,	0.00%)	[150]=227442 (2.34%,	20.31%)	[202]= 4 (0.00%,100.00%)	[254]=	0 (0.00%,100.00%)
[47]=	0 (0.00%,	0.00%)	[99]=	0 (0.00%,	0.00%)	[151]=174985 (1.80%,	22.11%)	[203]= 7 (0.00%,100.00%)	[255]=	3 (0.00%,100.00%)
[48]=	0 (0.00%,	0.00%)	[100]=	0 (0.00%,	0.00%)	[152]=197411 (2.03%,	24.14%)	[204]= 1 (0.00%,100.00%)		
[49]=	0 (0.00%,	0.00%)	[101]=	0 (0.00%,	0.00%)	[153]=194222 (2.00%,	26.13%)	[205]= 2 (0.00%,100.00%)		
[50]=	0 (0.00%,	0.00%)	[102]=	0 (0.00%,	0.00%)	[154]=195104 (2.00%,	28.13%)	[206]= 3 (0.00%,100.00%)		
[51]=	0 (0.00%,	0.00%)	[103]=	0 (0.00%,	0.00%)	[155]=159046 (1.63%,	29.77%)	[207]= 1 (0.00%,100.00%)		

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ESA – Channel 8 (PANCHROMATIC)

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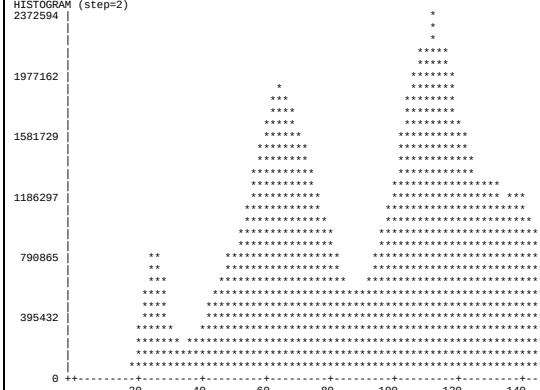
FILE dec.9

TOTAL NUMBER OF PIXELS =   206309824
IMAGE PIXELS           =   147170199 (71.33%)
BACKGROUND PIXELS      =    59139625 (28.67%)
MINIMUM                =          13
MAXIMUM                =         255
LEFT  BOUND 2%         =          25
RIGHT BOUND 2%         =         147
MEAN                   =      93.569
VARIANCE               =    1111.840
STANDARD DEVIATION     =      33.344
```

HISTOGRAM (step=2)



[0]=	0 (0.00%, 0.00%)	[52]=	925380 (0.63%, 11.53%)	[104]=1710012 (1.16%, 53.85%)	[156]=	69513 (0.05%, 99.71%)	[208]=	534 (0.00%,100.00%)
[1]=	0 (0.00%, 0.00%)	[53]=1022058 (0.69%, 12.23%)	[105]=1832794 (1.25%, 55.09%)	[157]=	63626 (0.04%, 99.75%)	[209]=	467 (0.00%,100.00%)
[2]=	0 (0.00%, 0.00%)	[54]=1129958 (0.77%, 13.00%)	[106]=1763143 (1.20%, 56.29%)	[158]=	49462 (0.03%, 99.79%)	[210]=	479 (0.00%,100.00%)
[3]=	0 (0.00%, 0.00%)	[55]=1149498 (0.78%, 13.78%)	[107]=1985185 (1.35%, 57.64%)	[159]=	41377 (0.03%, 99.81%)	[211]=	389 (0.00%,100.00%)
[4]=	0 (0.00%, 0.00%)	[56]=1185647 (0.81%, 14.58%)	[108]=2083609 (1.42%, 59.05%)	[160]=	32430 (0.02%, 99.84%)	[212]=	339 (0.00%,100.00%)
[5]=	0 (0.00%, 0.00%)	[57]=1364334 (0.93%, 15.51%)	[109]=2171817 (1.48%, 60.53%)	[161]=	26848 (0.02%, 99.86%)	[213]=	310 (0.00%,100.00%)
[6]=	0 (0.00%, 0.00%)	[58]=1506173 (1.02%, 16.53%)	[110]=2158902 (1.47%, 62.00%)	[162]=	23006 (0.02%, 99.87%)	[214]=	326 (0.00%,100.00%)
[7]=	0 (0.00%, 0.00%)	[59]=1408127 (0.96%, 17.49%)	[111]=2135244 (1.45%, 63.45%)	[163]=	19316 (0.01%, 99.88%)	[215]=	266 (0.00%,100.00%)
[8]=	0 (0.00%, 0.00%)	[60]=1635345 (1.11%, 18.60%)	[112]=2372594 (1.61%, 65.06%)	[164]=	15095 (0.01%, 99.89%)	[216]=	297 (0.00%,100.00%)
[9]=	0 (0.00%, 0.00%)	[61]=1711566 (1.16%, 19.76%)	[113]=2107899 (1.43%, 66.49%)	[165]=	14976 (0.01%, 99.90%)	[217]=	242 (0.00%,100.00%)
[10]=	0 (0.00%, 0.00%)	[62]=1831776 (1.24%, 21.01%)	[114]=1971570 (1.34%, 67.83%)	[166]=	12483 (0.01%, 99.91%)	[218]=	200 (0.00%,100.00%)
[11]=	0 (0.00%, 0.00%)	[63]=1821472 (1.24%, 22.25%)	[115]=2187131 (1.49%, 69.32%)	[167]=	10967 (0.01%, 99.92%)	[219]=	167 (0.00%,100.00%)
[12]=	0 (0.00%, 0.00%)	[64]=1787303 (1.21%, 23.46%)	[116]=2178662 (1.48%, 70.80%)	[168]=	10294 (0.01%, 99.93%)	[220]=	189 (0.00%,100.00%)
[13]=	1 (0.00%, 0.00%)	[65]=1917808 (1.30%, 24.76%)	[117]=2012529 (1.37%, 72.16%)	[169]=	9233 (0.01%, 99.93%)	[221]=	185 (0.00%,100.00%)
[14]=	19 (0.00%, 0.00%)	[66]=1896865 (1.29%, 26.05%)	[118]=1980254 (1.35%, 73.51%)	[170]=	7758 (0.01%, 99.94%)	[222]=	153 (0.00%,100.00%)
[15]=	270 (0.00%, 0.00%)	[67]=1714621 (1.17%, 27.22%)	[119]=1886786 (1.28%, 74.79%)	[171]=	6912 (0.00%, 99.94%)	[223]=	164 (0.00%,100.00%)
[16]=	2062 (0.00%, 0.00%)	[68]=1716012 (1.17%, 28.38%)	[120]=1599001 (1.09%, 75.88%)	[172]=	6448 (0.00%, 99.95%)	[224]=	134 (0.00%,100.00%)
[17]=	13144 (0.01%, 0.01%)	[69]=1802035 (1.22%, 29.61%)	[121]=1694495 (1.15%, 77.03%)	[173]=	5484 (0.00%, 99.95%)	[225]=	98 (0.00%,100.00%)
[18]=	44238 (0.03%, 0.04%)	[70]=1623218 (1.10%, 30.71%)	[122]=1628384 (1.11%, 78.14%)	[174]=	5148 (0.00%, 99.96%)	[226]=	114 (0.00%,100.00%)
[19]=	128801 (0.09%, 0.13%)	[71]=1530687 (1.04%, 31.75%)	[123]=1548457 (1.05%, 79.19%)	[175]=	4284 (0.00%, 99.96%)	[227]=	91 (0.00%,100.00%)
[20]=	278856 (0.19%, 0.32%)	[72]=1526565 (1.04%, 32.79%)	[124]=1452136 (0.99%, 80.18%)	[176]=	4300 (0.00%, 99.96%)	[228]=	61 (0.00%,100.00%)
[21]=	370873 (0.25%, 0.57%)	[73]=1443647 (0.98%, 33.77%)	[125]=1412760 (0.96%, 81.14%)	[177]=	3997 (0.00%, 99.96%)	[229]=	90 (0.00%,100.00%)
[22]=	492013 (0.33%, 0.90%)	[74]=1367017 (0.93%, 34.70%)	[126]=1340706 (0.91%, 82.05%)	[178]=	3833 (0.00%, 99.97%)	[230]=	73 (0.00%,100.00%)
[23]=	558966 (0.38%, 1.28%)	[75]=1129534 (0.77%, 35.47%)	[127]=1310542 (0.89%, 82.94%)	[179]=	3289 (0.00%, 99.97%)	[231]=	51 (0.00%,100.00%)
[24]=	647182 (0.44%, 1.72%)	[76]=1231020 (0.84%, 36.30%)	[128]=1334027 (0.91%, 83.84%)	[180]=	3068 (0.00%, 99.97%)	[232]=	55 (0.00%,100.00%)
[25]=	792482 (0.54%, 2.26%)	[77]=1191829 (0.81%, 37.11%)	[129]=1189633 (0.81%, 84.65%)	[181]=	2981 (0.00%, 99.97%)	[233]=	43 (0.00%,100.00%)
[26]=	836094 (0.57%, 2.83%)	[78]=1053234 (0.72%, 37.83%)	[130]=1297497 (0.88%, 85.53%)	[182]=	2643 (0.00%, 99.97%)	[234]=	41 (0.00%,100.00%)
[27]=	780255 (0.53%, 3.36%)	[79]=1058201 (0.72%, 38.55%)	[131]=1317008 (0.89%, 86.43%)	[183]=	2482 (0.00%, 99.98%)	[235]=	32 (0.00%,100.00%)
[28]=	663002 (0.45%, 3.81%)	[80]= 990403 (0.67%, 39.22%)	[132]=1297620 (0.88%, 87.31%)	[184]=	2308 (0.00%, 99.98%)	[236]=	42 (0.00%,100.00%)
[29]=	479194 (0.33%, 4.14%)	[81]= 920625 (0.63%, 39.84%)	[133]=1240700 (0.84%, 88.15%)	[185]=	2138 (0.00%, 99.98%)	[237]=	24 (0.00%,100.00%)
[30]=	369721 (0.25%, 4.39%)	[82]= 825405 (0.56%, 40.41%)	[134]=1140242 (0.77%, 88.93%)	[186]=	2069 (0.00%, 99.98%)	[238]=	31 (0.00%,100.00%)
[31]=	307485 (0.21%, 4.60%)	[83]= 787724 (0.54%, 40.94%)	[135]=1179861 (0.80%, 89.73%)	[187]=	2018 (0.00%, 99.98%)	[239]=	26 (0.00%,100.00%)
[32]=	267641 (0.18%, 4.78%)	[84]= 700371 (0.48%, 41.42%)	[136]=1175591 (0.80%, 90.53%)	[188]=	1848 (0.00%, 99.98%)	[240]=	13 (0.00%,100.00%)
[33]=	232339 (0.16%, 4.94%)	[85]= 624337 (0.42%, 41.84%)	[137]=1206208 (0.82%, 91.35%)	[189]=	1711 (0.00%, 99.98%)	[241]=	23 (0.00%,100.00%)
[34]=	220343 (0.15%, 5.09%)	[86]= 605605 (0.41%, 42.25%)	[138]=1233524 (0.84%, 92.19%)	[190]=	1622 (0.00%, 99.99%)	[242]=	20 (0.00%,100.00%)
[35]=	230280 (0.16%, 5.24%)	[87]= 527837 (0.36%, 42.61%)	[139]=1237644 (0.84%, 93.03%)	[191]=	1505 (0.00%, 99.99%)	[243]=	17 (0.00%,100.00%)
[36]=	237498 (0.16%, 5.40%)	[88]= 553993 (0.38%, 42.99%)	[140]=1218195 (0.83%, 93.85%)	[192]=	1301 (0.00%, 99.99%)	[244]=	7 (0.00%,100.00%)
[37]=	253171 (0.17%, 5.58%)	[89]= 552688 (0.38%, 43.36%)	[141]=1164371 (0.79%, 94.65%)	[193]=	1323 (0.00%, 99.99%)	[245]=	6 (0.00%,100.00%)
[38]=	278071 (0.19%, 5.76%)	[90]= 567071 (0.39%, 43.75%)	[142]=1047475 (0.71%, 95.36%)	[194]=	1210 (0.00%, 99.99%)	[246]=	6 (0.00%,100.00%)
[39]=	276280 (0.19%, 5.95%)	[91]= 613895 (0.42%, 44.17%)	[143]=1027560 (0.70%, 96.06%)	[195]=	1192 (0.00%, 99.99%)	[247]=	5 (0.00%,100.00%)
[40]=	350844 (0.24%, 6.19%)	[92]= 570799 (0.39%, 44.55%)	[144]=1002526 (0.68%, 96.74%)	[196]=	925 (0.00%, 99.99%)	[248]=	3 (0.00%,100.00%)
[41]=	388798 (0.26%, 6.46%)	[93]= 644020 (0.44%, 44.99%)	[145]= 788309 (0.54%, 97.27%)	[197]=	975 (0.00%, 99.99%)	[249]=	7 (0.00%,100.00%)
[42]=	427484 (0.29%, 6.75%)	[94]= 713966 (0.49%, 45.48%)	[146]= 755516 (0.51%, 97.79%)	[198]=	1017 (0.00%, 99.99%)	[250]=	1 (0.00%,100.00%)
[43]=	493334 (0.34%, 7.08%)	[95]= 817477 (0.56%, 46.03%)	[147]= 623481 (0.42%, 98.21%)	[199]=	843 (0.00%, 99.99%)	[251]=	2 (0.00%,100.00%)
[44]=	525920 (0.36%, 7.44%)	[96]= 892520 (0.61%, 46.64%)	[148]= 528652 (0.36%, 98.57%)	[200]=	851 (0.00%, 99.99%)	[252]=	1 (0.00%,100.00%)
[45]=	590738 (0.40%, 7.84%)	[97]=1014268 (0.69%, 47.33%)	[149]= 441727 (0.30%, 98.87%)	[201]=	747 (0.00%, 99.99%)	[253]=	2 (0.00%,100.00%)
[46]=	644043 (0.44%, 8.28%)	[98]=1041564 (0.71%, 48.04%)	[150]= 345858 (0.24%, 99.10%)	[202]=	783 (0.00%, 99.99%)	[254]=	0 (0.00%,100.00%)
[47]=	676589 (0.46%, 8.74%)	[99]=1162524 (0.79%, 48.83%)	[151]= 259836 (0.18%, 99.28%)	[203]=	766 (0.00%, 99.99%)	[255]=	4 (0.00%,100.00%)
[48]=	677855 (0.46%, 9.20%)	[100]=1259664 (0.86%, 49.68%)	[152]= 197557 (0.13%, 99.41%)	[204]=	631 (0.00%, 99.99%)		
[49]=	797057 (0.54%, 9.74%)	[101]=1304396 (0.89%, 50.57%)	[153]= 161497 (0.11%, 99.52%)	[205]=	591 (0.00%,100.00%)		
[50]=	858393 (0.58%, 10.32%)	[102]=1503162 (1.02%, 51.59%)	[154]= 110770 (0.08%, 99.60%)	[206]=	539 (0.00%,100.00%)		
[51]=	856584 (0.58%, 10.90%)	[103]=1610758 (1.09%, 52.68%)	[155]= 92315 (0.06%, 99.66%)	[207]=	517 (0.00%,100.00%)		

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USGS – Channel 8 (PANCHROMATIC)

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FILE dec.9

TOTAL NUMBER OF PIXELS =   235614761
IMAGE PIXELS           =   156066975 (66.24%)
BACKGROUND PIXELS      =    79547786 (33.76%)
MINIMUM                =           1
MAXIMUM                =         255
LEFT  BOUND 2%         =          26
RIGHT BOUND 2%         =         147
MEAN                   =      93.509
VARIANCE               =    1108.991
STANDARD DEVIATION     =      33.302
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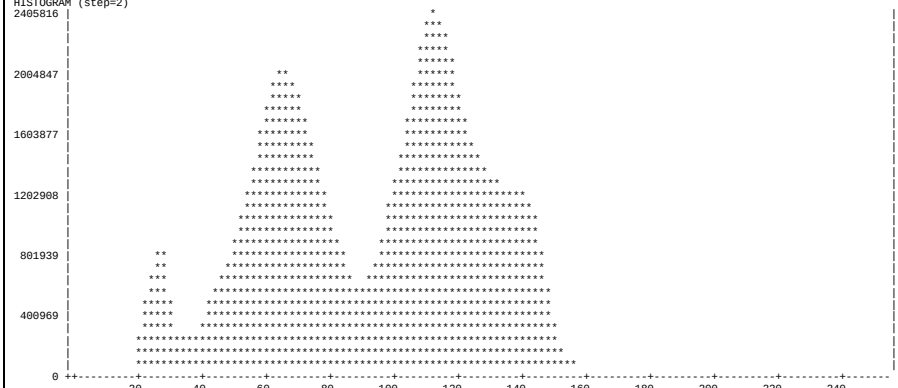
HISTOGRAM (step=2)

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[  0]=      0 ( 0.00%,  0.00%)  [ 52]= 998417 ( 0.64%, 11.21%)  [104]=1629200 ( 1.04%, 53.91%)  [156]=  81016 ( 0.05%, 99.72%)  [208]=    507 ( 0.00%,100.00%)
[  1]=    128 ( 0.00%,  0.00%)  [ 53]=1058693 ( 0.68%, 11.89%)  [105]=1724546 ( 1.11%, 55.02%)  [157]=  63092 ( 0.04%, 99.76%)  [209]=    447 ( 0.00%,100.00%)
[  2]=   1039 ( 0.00%,  0.00%)  [ 54]=1142265 ( 0.73%, 12.62%)  [106]=1854694 ( 1.19%, 56.20%)  [158]=  51828 ( 0.03%, 99.79%)  [210]=    433 ( 0.00%,100.00%)
[  3]=   5467 ( 0.00%,  0.00%)  [ 55]=1219933 ( 0.78%, 13.40%)  [107]=1977238 ( 1.27%, 57.47%)  [159]=  42119 ( 0.03%, 99.82%)  [211]=    383 ( 0.00%,100.00%)
[  4]=  19504 ( 0.01%,  0.02%)  [ 56]=1324049 ( 0.85%, 14.25%)  [108]=2068894 ( 1.33%, 58.80%)  [160]=  33920 ( 0.02%, 99.84%)  [212]=    357 ( 0.00%,100.00%)
[  5]=  43769 ( 0.03%,  0.04%)  [ 57]=1418570 ( 0.91%, 15.16%)  [109]=2200021 ( 1.41%, 60.21%)  [161]=  28250 ( 0.02%, 99.86%)  [213]=    300 ( 0.00%,100.00%)
[  6]=  62164 ( 0.04%,  0.08%)  [ 58]=1517636 ( 0.97%, 16.13%)  [110]=2253969 ( 1.44%, 61.65%)  [162]=  23289 ( 0.01%, 99.87%)  [214]=    316 ( 0.00%,100.00%)
[  7]=  56773 ( 0.04%,  0.12%)  [ 59]=1627898 ( 1.04%, 17.18%)  [111]=2341182 ( 1.50%, 63.15%)  [163]=  20213 ( 0.01%, 99.89%)  [215]=    304 ( 0.00%,100.00%)
[  8]=  34652 ( 0.02%,  0.14%)  [ 60]=1718045 ( 1.10%, 18.28%)  [112]=2376096 ( 1.52%, 64.67%)  [164]=  17194 ( 0.01%, 99.90%)  [216]=    273 ( 0.00%,100.00%)
[  9]=  16131 ( 0.01%,  0.15%)  [ 61]=1824416 ( 1.17%, 19.45%)  [113]=2405816 ( 1.54%, 66.21%)  [165]=  15313 ( 0.01%, 99.91%)  [217]=    231 ( 0.00%,100.00%)
[ 10]=   6300 ( 0.00%,  0.16%)  [ 62]=1879387 ( 1.20%, 20.65%)  [114]=2364090 ( 1.51%, 67.73%)  [166]=  13133 ( 0.01%, 99.91%)  [218]=    207 ( 0.00%,100.00%)
[ 11]=   3205 ( 0.00%,  0.16%)  [ 63]=1946158 ( 1.25%, 21.90%)  [115]=2339937 ( 1.50%, 69.23%)  [167]=  11648 ( 0.01%, 99.92%)  [219]=    191 ( 0.00%,100.00%)
[ 12]=   2225 ( 0.00%,  0.16%)  [ 64]=1969696 ( 1.26%, 23.16%)  [116]=2276801 ( 1.46%, 70.69%)  [168]=  10536 ( 0.01%, 99.93%)  [220]=    194 ( 0.00%,100.00%)
[ 13]=   2052 ( 0.00%,  0.16%)  [ 65]=2008162 ( 1.29%, 24.45%)  [117]=2169232 ( 1.39%, 72.08%)  [169]=   9461 ( 0.01%, 99.94%)  [221]=    178 ( 0.00%,100.00%)
[ 14]=   1958 ( 0.00%,  0.16%)  [ 66]=2027348 ( 1.30%, 25.75%)  [118]=2102387 ( 1.35%, 73.42%)  [170]=   8427 ( 0.01%, 99.94%)  [222]=    197 ( 0.00%,100.00%)
[ 15]=   1801 ( 0.00%,  0.16%)  [ 67]=1980443 ( 1.27%, 27.02%)  [119]=1973187 ( 1.26%, 74.69%)  [171]=   7285 ( 0.00%, 99.95%)  [223]=    132 ( 0.00%,100.00%)
[ 16]=   2068 ( 0.00%,  0.17%)  [ 68]=1996212 ( 1.28%, 28.29%)  [120]=1888144 ( 1.21%, 75.90%)  [172]=   6662 ( 0.00%, 99.95%)  [224]=    158 ( 0.00%,100.00%)
[ 17]=   4264 ( 0.00%,  0.17%)  [ 69]=1903495 ( 1.22%, 29.51%)  [121]=1752397 ( 1.12%, 77.02%)  [173]=   5913 ( 0.00%, 99.95%)  [225]=    104 ( 0.00%,100.00%)
[ 18]=  16077 ( 0.01%,  0.18%)  [ 70]=1872789 ( 1.20%, 30.71%)  [122]=1705652 ( 1.09%, 78.11%)  [174]=   5355 ( 0.00%, 99.96%)  [226]=     92 ( 0.00%,100.00%)
[ 19]=  57955 ( 0.04%,  0.22%)  [ 71]=1773235 ( 1.14%, 31.85%)  [123]=1614373 ( 1.03%, 79.15%)  [175]=   4974 ( 0.00%, 99.96%)  [227]=     87 ( 0.00%,100.00%)
[ 20]= 153772 ( 0.10%,  0.31%)  [ 72]=1718586 ( 1.10%, 32.95%)  [124]=1569676 ( 1.01%, 80.15%)  [176]=   4375 ( 0.00%, 99.96%)  [228]=     93 ( 0.00%,100.00%)
[ 21]= 285231 ( 0.18%,  0.50%)  [ 73]=1620780 ( 1.04%, 33.99%)  [125]=1510966 ( 0.97%, 81.12%)  [177]=   4037 ( 0.00%, 99.97%)  [229]=     72 ( 0.00%,100.00%)
[ 22]= 411737 ( 0.26%,  0.76%)  [ 74]=1534802 ( 0.98%, 34.97%)  [126]=1468428 ( 0.94%, 82.06%)  [178]=   3694 ( 0.00%, 99.97%)  [230]=     64 ( 0.00%,100.00%)
[ 23]= 488763 ( 0.31%,  1.07%)  [ 75]=1480313 ( 0.95%, 35.92%)  [127]=1440407 ( 0.92%, 82.99%)  [179]=   3441 ( 0.00%, 99.97%)  [231]=     55 ( 0.00%,100.00%)
[ 24]= 548083 ( 0.35%,  1.43%)  [ 76]=1389229 ( 0.89%, 36.81%)  [128]=1387401 ( 0.89%, 83.88%)  [180]=   3192 ( 0.00%, 99.97%)  [232]=     54 ( 0.00%,100.00%)
[ 25]= 665925 ( 0.43%,  1.85%)  [ 77]=1339452 ( 0.86%, 37.67%)  [129]=1367018 ( 0.88%, 84.75%)  [181]=   3142 ( 0.00%, 99.97%)  [233]=     47 ( 0.00%,100.00%)
[ 26]= 781469 ( 0.50%,  2.35%)  [ 78]=1255200 ( 0.80%, 38.47%)  [130]=1337293 ( 0.86%, 85.61%)  [182]=   2749 ( 0.00%, 99.98%)  [234]=     40 ( 0.00%,100.00%)
[ 27]= 861148 ( 0.55%,  2.90%)  [ 79]=1191842 ( 0.76%, 39.24%)  [131]=1320202 ( 0.85%, 86.45%)  [183]=   2557 ( 0.00%, 99.98%)  [235]=     27 ( 0.00%,100.00%)
[ 28]= 802430 ( 0.51%,  3.42%)  [ 80]=1107917 ( 0.71%, 39.95%)  [132]=1295949 ( 0.83%, 87.28%)  [184]=   2388 ( 0.00%, 99.98%)  [236]=     32 ( 0.00%,100.00%)
[ 29]= 665953 ( 0.43%,  3.85%)  [ 81]=1035131 ( 0.66%, 40.61%)  [133]=1243086 ( 0.80%, 88.08%)  [185]=   2222 ( 0.00%, 99.98%)  [237]=     33 ( 0.00%,100.00%)
[ 30]= 511961 ( 0.33%,  4.17%)  [ 82]= 961645 ( 0.62%, 41.23%)  [134]=1244041 ( 0.80%, 88.88%)  [186]=   2044 ( 0.00%, 99.98%)  [238]=     21 ( 0.00%,100.00%)
[ 31]= 397128 ( 0.25%,  4.43%)  [ 83]= 874900 ( 0.56%, 41.79%)  [135]=1224000 ( 0.78%, 89.66%)  [187]=   1867 ( 0.00%, 99.98%)  [239]=     24 ( 0.00%,100.00%)
[ 32]= 315475 ( 0.20%,  4.63%)  [ 84]= 806702 ( 0.52%, 42.31%)  [136]=1242229 ( 0.80%, 90.46%)  [188]=   1808 ( 0.00%, 99.98%)  [240]=     20 ( 0.00%,100.00%)
[ 33]= 265747 ( 0.17%,  4.80%)  [ 85]= 724532 ( 0.46%, 42.77%)  [137]=1213716 ( 0.78%, 91.24%)  [189]=   1643 ( 0.00%, 99.98%)  [241]=     20 ( 0.00%,100.00%)
[ 34]= 245049 ( 0.16%,  4.96%)  [ 86]= 666200 ( 0.43%, 43.20%)  [138]=1220518 ( 0.78%, 92.02%)  [190]=   1581 ( 0.00%, 99.99%)  [242]=     22 ( 0.00%,100.00%)
[ 35]= 240701 ( 0.15%,  5.11%)  [ 87]= 605479 ( 0.39%, 43.58%)  [139]=1203191 ( 0.77%, 92.79%)  [191]=   1433 ( 0.00%, 99.99%)  [243]=     24 ( 0.00%,100.00%)
[ 36]= 248390 ( 0.16%,  5.27%)  [ 88]= 576941 ( 0.37%, 43.95%)  [140]=1223232 ( 0.78%, 93.57%)  [192]=   1410 ( 0.00%, 99.99%)  [244]=      4 ( 0.00%,100.00%)
[ 37]= 260954 ( 0.17%,  5.44%)  [ 89]= 558094 ( 0.36%, 44.31%)  [141]=1215954 ( 0.78%, 94.35%)  [193]=   1308 ( 0.00%, 99.99%)  [245]=      5 ( 0.00%,100.00%)
[ 38]= 288327 ( 0.18%,  5.62%)  [ 90]= 566969 ( 0.36%, 44.67%)  [142]=1175887 ( 0.75%, 95.11%)  [194]=   1183 ( 0.00%, 99.99%)  [246]=      6 ( 0.00%,100.00%)
[ 39]= 316218 ( 0.20%,  5.83%)  [ 91]= 583527 ( 0.37%, 45.05%)  [143]=1140988 ( 0.73%, 95.84%)  [195]=   1242 ( 0.00%, 99.99%)  [247]=      6 ( 0.00%,100.00%)
[ 40]= 345738 ( 0.22%,  6.05%)  [ 92]= 609946 ( 0.39%, 45.44%)  [144]=1053988 ( 0.68%, 96.51%)  [196]=   1137 ( 0.00%, 99.99%)  [248]=      7 ( 0.00%,100.00%)
[ 41]= 394316 ( 0.25%,  6.30%)  [ 93]= 665314 ( 0.43%, 45.87%)  [145]= 969369 ( 0.62%, 97.13%)  [197]=   1034 ( 0.00%, 99.99%)  [249]=      1 ( 0.00%,100.00%)
[ 42]= 431240 ( 0.28%,  6.58%)  [ 94]= 706072 ( 0.45%, 46.32%)  [146]= 842612 ( 0.54%, 97.67%)  [198]=   1001 ( 0.00%, 99.99%)  [250]=      5 ( 0.00%,100.00%)
[ 43]= 487964 ( 0.31%,  6.89%)  [ 95]= 788857 ( 0.51%, 46.82%)  [147]= 723657 ( 0.46%, 98.14%)  [199]=    937 ( 0.00%, 99.99%)  [251]=      3 ( 0.00%,100.00%)
[ 44]= 533547 ( 0.34%,  7.23%)  [ 96]= 845825 ( 0.54%, 47.37%)  [148]= 591923 ( 0.38%, 98.52%)  [200]=    878 ( 0.00%, 99.99%)  [252]=      1 ( 0.00%,100.00%)
[ 45]= 587938 ( 0.38%,  7.61%)  [ 97]= 942894 ( 0.60%, 47.97%)  [149]= 481568 ( 0.31%, 98.82%)  [201]=    801 ( 0.00%, 99.99%)  [253]=      1 ( 0.00%,100.00%)
[ 46]= 627337 ( 0.40%,  8.01%)  [ 98]=1032738 ( 0.66%, 48.63%)  [150]= 379933 ( 0.24%, 99.07%)  [202]=    798 ( 0.00%, 99.99%)  [254]=      0 ( 0.00%,100.00%)
[ 47]= 692362 ( 0.44%,  8.45%)  [ 99]=1129527 ( 0.72%, 49.35%)  [151]= 293469 ( 0.19%, 99.26%)  [203]=    657 ( 0.00%, 99.99%)  [255]=      5 ( 0.00%,100.00%)
[ 48]= 745140 ( 0.48%,  8.93%)  [100]=1230879 ( 0.79%, 50.14%)  [152]= 227888 ( 0.15%, 99.40%)  [204]=    706 ( 0.00%,100.00%)
[ 49]= 792799 ( 0.51%,  9.44%)  [101]=1317927 ( 0.84%, 50.99%)  [153]= 173946 ( 0.11%, 99.51%)  [205]=    625 ( 0.00%,100.00%)
[ 50]= 854119 ( 0.55%,  9.99%)  [102]=1421204 ( 0.91%, 51.90%)  [154]= 134602 ( 0.09%, 99.60%)  [206]=    562 ( 0.00%,100.00%)
[ 51]= 916770 ( 0.59%, 10.57%)  [103]=1509822 ( 0.97%, 52.87%)  [155]= 103059 ( 0.07%, 99.67%)  [207]=    514 ( 0.00%,100.00%)
```

C9. Very close distributions

Appearance of histograms, location of left/right bounds of the 2% automatic stretching, mean, standard deviation and location of maximum are almost the same in ESA and USGS scenes.

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C10. Number of background pixels

Number of background pixels in USGS scene (33.8%) is always greater than the one found in ESA scene (28.66%). This supplementary number of background pixels (+5%) is due to the different way to cut scenes (see section 2.6).

C11. Inconsistent way to interpolate along borders in USGS images

In USGS images, radiometric values found along the borders are not consistent. In channels 1, 2, 3, 4 and 9, we may note that low radiometric values are present in USGS channels and not in ESA images. These low values result in a bias when computing the minimum value in image (for example, the minimum observed for PANCHROMATIC channel is 13 in ESA image while a value 1 has been found in USGS image).

Figure here below demonstrates that interpolation computed along the left border of channel 9 involves background pixel (value 0) resulting in an inconsistent radiometry distribution in range [1,14].

As said in section 2.6, swath processed in USGS image is too wide. End-user will find inconsistent radiometric values on the border that may introduce errors within their thematic studies (for example while classifying data).

This defect does not appear in ESA image.

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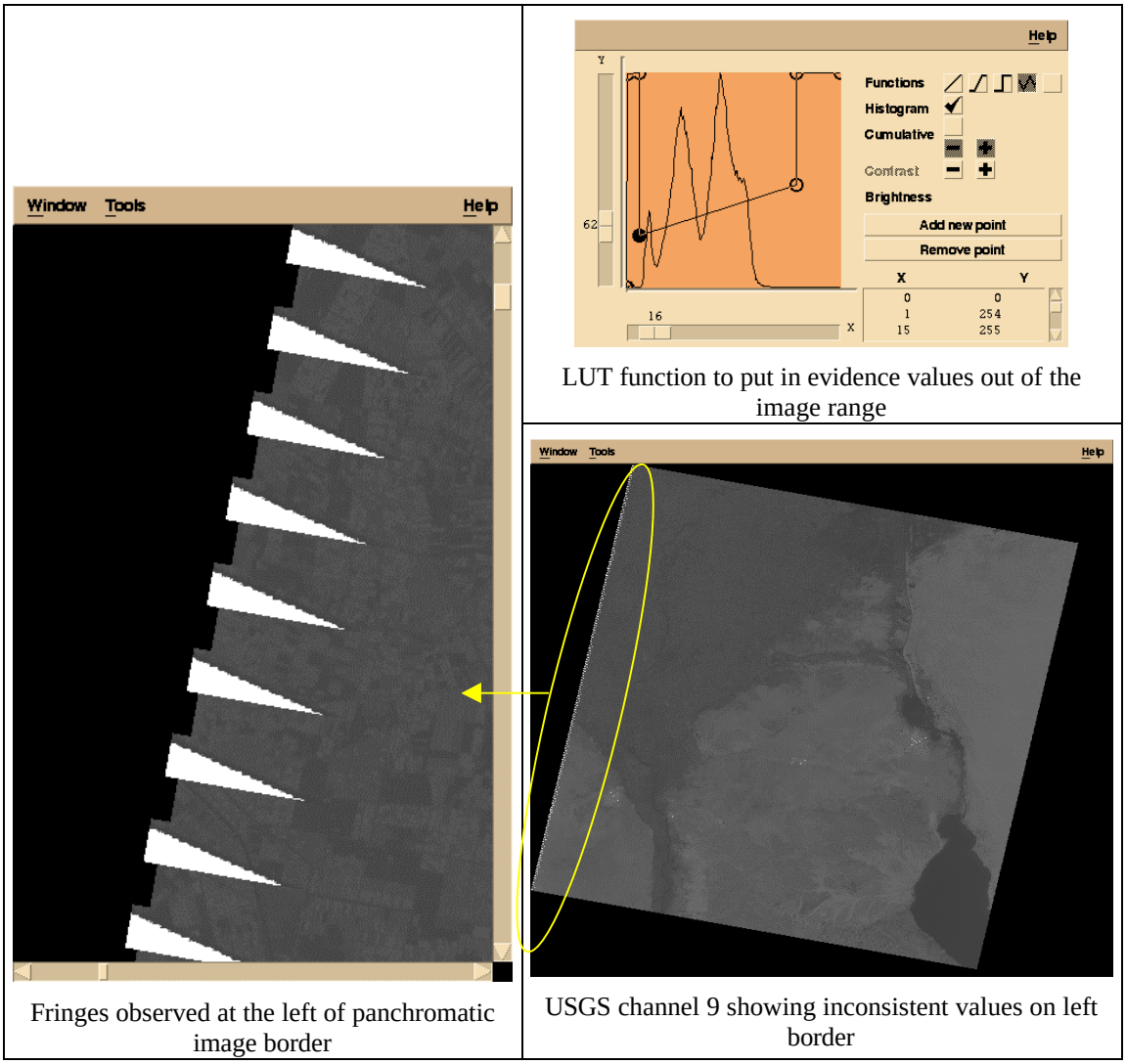

LUT function to put in evidence values out of the image range

Fringes observed at the left of panchromatic image border

USGS channel 9 showing inconsistent values on left border

Figure 2.8.f – Interpolated pixels in USGS image border.

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APPENDIX A - SCENE 176-39 19/03/2001 – ESA HEADER

A.1 L71176039_03920010319_HRF.FST – VNIR/SWIR

Administrative record

```
REQ ID =0001010630000000000   LOC =176/039F          ACQUISITION DATE =20010319
SATELLITE =LANDSAT7   SENSOR =ETM+       SENSOR MODE =NORMAL LOOK ANGLE =  0.00
                        LOCATION =                   ACQUISITION DATE =
SATELLITE =           SENSOR =           SENSOR MODE =       LOOK ANGLE =
                        LOCATION =                   ACQUISITION DATE =
SATELLITE =           SENSOR =           SENSOR MODE =       LOOK ANGLE =
                        LOCATION =                   ACQUISITION DATE =
SATELLITE =           SENSOR =           SENSOR MODE =       LOOK ANGLE =
PRODUCT TYPE =MAP ORIENTED       PRODUCT SIZE =FULL SCENE
TYPE OF PROCESSING =SYSTEMATIC  RESAMPLING =NN
VOLUME #/# IN SET =01/01 PIXELS PER LINE =7364  LINES PER BAND =7004 /7004
START LINE # =      BLOCKING FACTOR =   REC SIZE  =51577456  PIXEL SIZE = 30.00
OUTPUT BITS PER PIXEL =8  ACQUIRED BITS PER PIXEL =8
BANDS PRESENT =123457
FILENAME =L71176039_03920010319_B10.FSTFILENAME =L71176039_03920010319_B20.FST
FILENAME =L71176039_03920010319_B30.FSTFILENAME =L71176039_03920010319_B40.FST
FILENAME =L71176039_03920010319_B50.FSTFILENAME =L72176039_03920010319_B70.FST


REV         L7A
```

Radiometric record

```
GAINS AND BIASES IN ASCENDING BAND NUMBER ORDER
      -6.200000000000000        1.176078431372549
      -6.400000000000000        1.205098039215686
      -5.000000000000000        0.938823529411765
      -5.100000000000000        0.965490196078431
      -1.000000000000000        0.190470588235294
      -0.350000000000000        0.066235294117647
```

Geometric record

```
GEOMETRIC DATA MAP PROJECTION =UTM  ELLIPSOID =WGS84              DATUM =WGS84
USGS PROJECTION PARAMETERS = 0.637813700000000D+07    0.635675231400000D+07
0.000000000000000D+00    0.000000000000000D+00    0.000000000000000D+00
0.000000000000000D+00    0.000000000000000D+00    0.000000000000000D+00
0.000000000000000D+00    0.000000000000000D+00    0.000000000000000D+00
0.000000000000000D+00    0.000000000000000D+00    0.000000000000000D+00
0.000000000000000D+00    USGS MAP ZONE =36
UL = 0304449.7758E 311423.1889N    285444.500   3458363.750
UR = 0330359.5294E 311534.2086N    506334.500   3458363.750
LR = 0330354.9563E 292149.0072N    506334.500   3248273.750
LL = 0304724.2504E 292043.1579N    285444.500   3248273.750
CENTER = 0315507.0907E 301825.3413N    396024.469   3353303.750 3682  3502
OFFSET =0      ORIENTATION ANGLE =-10.03
SUN ELEVATION ANGLE =50.2 SUN AZIMUTH ANGLE =135.8
```

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A.2 L71176039_03920010319_HTM.FST - THERMAL

Administrative record

```
REQ ID =000101063000000000   LOC =176/039F          ACQUISITION DATE =20010319
SATELLITE =LANDSAT7   SENSOR =ETM+       SENSOR MODE =NORMAL LOOK ANGLE =  0.00
                        LOCATION =                  ACQUISITION DATE =
SATELLITE =           SENSOR =           SENSOR MODE =       LOOK ANGLE =
                        LOCATION =                  ACQUISITION DATE =
SATELLITE =           SENSOR =           SENSOR MODE =       LOOK ANGLE =
                        LOCATION =                  ACQUISITION DATE =
SATELLITE =           SENSOR =           SENSOR MODE =       LOOK ANGLE =
PRODUCT TYPE =MAP ORIENTED       PRODUCT SIZE =FULL SCENE
TYPE OF PROCESSING =SYSTEMATIC  RESAMPLING =NN
VOLUME #/# IN SET =01/01 PIXELS PER LINE =7364  LINES PER BAND =7004 /7004
START LINE # =      BLOCKING FACTOR =   REC SIZE  =51577456  PIXEL SIZE = 30.00
OUTPUT BITS PER PIXEL =8  ACQUIRED BITS PER PIXEL =8
BANDS PRESENT =LH
FILENAME =L71176039_03920010319_B61.FSTFILENAME =L72176039_03920010319_B62.FST
FILENAME =                              FILENAME =
FILENAME =                              FILENAME =


REV         L7A
```

Radiometric record

```
GAINS AND BIASES IN ASCENDING BAND NUMBER ORDER
       0.000000000000000        0.066823529411765
       3.200000000000000        0.037058823529412
```

Geometric record

```
GEOMETRIC DATA MAP PROJECTION =UTM  ELLIPSOID =WGS84              DATUM =WGS84
USGS PROJECTION PARAMETERS = 0.637813700000000D+07    0.635675231400000D+07
0.000000000000000D+00    0.000000000000000D+00    0.000000000000000D+00
0.000000000000000D+00    0.000000000000000D+00    0.000000000000000D+00
0.000000000000000D+00    0.000000000000000D+00    0.000000000000000D+00
0.000000000000000D+00    0.000000000000000D+00    0.000000000000000D+00
0.000000000000000D+00    USGS MAP ZONE =36
UL = 0304449.1990E 311423.6627N    285429.500   3458378.750
UR = 0330358.9526E 311534.6961N    506319.500   3458378.750
LR = 0330354.3933E 292149.4947N    506319.500   3248288.750
LL = 0304723.6874E 292043.6386N    285429.500   3248288.750
CENTER = 0315507.0907E 301825.3413N    396024.469   3353303.750 3682  3502
OFFSET =0      ORIENTATION ANGLE =-10.03
SUN ELEVATION ANGLE =50.2 SUN AZIMUTH ANGLE =135.8
```

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A.3 L71176039_03920010319_HPN.FST - PANCHROMATIC

Administrative record

```
REQ ID =000101063000000000   LOC =176/039F          ACQUISITION DATE =20010319
SATELLITE =LANDSAT7   SENSOR =ETM+       SENSOR MODE =NORMAL LOOK ANGLE =  0.00
                        LOCATION =                  ACQUISITION DATE =
SATELLITE =           SENSOR =           SENSOR MODE =       LOOK ANGLE =
                        LOCATION =                  ACQUISITION DATE =
SATELLITE =           SENSOR =           SENSOR MODE =       LOOK ANGLE =
                        LOCATION =                  ACQUISITION DATE =
SATELLITE =           SENSOR =           SENSOR MODE =       LOOK ANGLE =
PRODUCT TYPE =MAP ORIENTED       PRODUCT SIZE =FULL SCENE
TYPE OF PROCESSING =SYSTEMATIC  RESAMPLING =NN
VOLUME #/# IN SET =01/01 PIXELS PER LINE =14728 LINES PER BAND =14008/14008
START LINE # =      BLOCKING FACTOR =   REC SIZE  =206309824 PIXEL SIZE = 15.00
OUTPUT BITS PER PIXEL =8  ACQUIRED BITS PER PIXEL =8
BANDS PRESENT =8
FILENAME =L72176039_03920010319_B80.FSTFILENAME =
FILENAME =                              FILENAME =
FILENAME =                              FILENAME =


REV         L7A
```

Radiometric record

```
GAINS AND BIASES IN ASCENDING BAND NUMBER ORDER
      -4.700000000000000        0.971764705882353
```

Geometric record

```
GEOMETRIC DATA MAP PROJECTION =UTM  ELLIPSOID =WGS84              DATUM =WGS84
USGS PROJECTION PARAMETERS = 0.6378137000000000D+07    0.6356752314000000D+07
0.000000000000000D+00    0.000000000000000D+00    0.000000000000000D+00
0.000000000000000D+00    0.000000000000000D+00    0.000000000000000D+00
0.000000000000000D+00    0.000000000000000D+00    0.000000000000000D+00
0.000000000000000D+00    0.000000000000000D+00    0.000000000000000D+00
0.000000000000000D+00    USGS MAP ZONE =36
UL = 0304449.7758E 311423.1889N    285444.500   3458363.750
UR = 0330400.0924E 311534.2086N    506349.500   3458363.750
LR = 0330355.5056E 292148.5197N    506349.500   3248258.750
LL = 0304724.2642E 292042.6704N    285444.500   3248258.750
CENTER = 0315507.0907E 301825.3413N    396024.469   3353303.750 7364  7004
OFFSET =0      ORIENTATION ANGLE =-10.03
SUN ELEVATION ANGLE =50.2 SUN AZIMUTH ANGLE =135.8
```

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APPENDIX B - SCENE 176-39 19/03/2001 – USGS HEADER

B.1 L71176039_03920010319_HRF.FST – VNIR/SWIR

Administrative record

```
REQ ID =0750107040003_00001  LOC =176/0390000       ACQUISITION DATE =20010319
SATELLITE =LANDSAT7   SENSOR =ETM+       SENSOR MODE =NORMAL LOOK ANGLE =0.00
                        LOCATION =                  ACQUISITION DATE =
SATELLITE =           SENSOR =           SENSOR MODE =       LOOK ANGLE =
                        LOCATION =                  ACQUISITION DATE =
SATELLITE =           SENSOR =           SENSOR MODE =       LOOK ANGLE =
                        LOCATION =                  ACQUISITION DATE =
SATELLITE =           SENSOR =           SENSOR MODE =       LOOK ANGLE =
PRODUCT TYPE =MAP ORIENTED       PRODUCT SIZE =FULL SCENE
TYPE OF PROCESSING =SYSTEMATIC  RESAMPLING =NN
VOLUME #/# IN SET =01/01 PIXELS PER LINE =8181  LINES PER BAND =7201 /7201
START LINE # =      BLOCKING FACTOR =   REC SIZE  =58911381  PIXEL SIZE =30.00
OUTPUT BITS PER PIXEL =8  ACQUIRED BITS PER PIXEL =8
BANDS PRESENT =123457
FILENAME =L71176039_03920010319_B10.FSTFILENAME =L71176039_03920010319_B20.FST
FILENAME =L71176039_03920010319_B30.FSTFILENAME =L71176039_03920010319_B40.FST
FILENAME =L71176039_03920010319_B50.FSTFILENAME =L72176039_03920010319_B70.FST


REV         L7A
```

Radiometric record

```
BIASES AND GAINS IN ASCENDING BAND NUMBER ORDER
-7.380708517990713       1.180708708725576
-7.609842591398344       1.209842496030913
-5.942519661009781       0.942519661009781
-6.069291266869373       0.969291362236804
-1.191220471239465       0.191220471239465
-0.416496060612633       0.066496066573098
```

Geometric record

```
GEOMETRIC DATA MAP PROJECTION =UTM  ELLIPSOID =WGS84              DATUM =WGS84
USGS PROJECTION PARAMETERS = 0.000000000000000        0.000000000000000
0.000000000000000        0.000000000000000        0.000000000000000
0.000000000000000        0.000000000000000        0.000000000000000
0.000000000000000        0.000000000000000        0.000000000000000
0.000000000000000        0.000000000000000        0.000000000000000
0.000000000000000        USGS MAP ZONE =36
UL = 0303913.2473E 311555.7520N 276600.000    3461400.000
UR = 0331352.1132E 311712.1444N 522000.000    3461400.000
LR = 0331335.8053E 292015.0006N 522000.000    3245400.000
LL = 0304158.6095E 291904.3184N 276600.000    3245400.000
CENTER = 0315423.6518E 301823.1230N 394863.531    3353246.500   4091  3601
OFFSET =122    ORIENTATION ANGLE =0.00
SUN ELEVATION ANGLE =50.2 SUN AZIMUTH ANGLE =135.8
```

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B.2 L71176039_03920010319_HTM.FST - THERMAL

Administrative record

```
REQ ID =0750107040003_00001  LOC =176/0390000       ACQUISITION DATE =20010319
SATELLITE =LANDSAT7   SENSOR =ETM+       SENSOR MODE =NORMAL LOOK ANGLE =0.00
                        LOCATION =                  ACQUISITION DATE =
SATELLITE =           SENSOR =           SENSOR MODE =       LOOK ANGLE =
                        LOCATION =                  ACQUISITION DATE =
SATELLITE =           SENSOR =           SENSOR MODE =       LOOK ANGLE =
                        LOCATION =                  ACQUISITION DATE =
SATELLITE =           SENSOR =           SENSOR MODE =       LOOK ANGLE =
PRODUCT TYPE =MAP ORIENTED       PRODUCT SIZE =FULL SCENE
TYPE OF PROCESSING =SYSTEMATIC  RESAMPLING =NN
VOLUME #/# IN SET =01/01 PIXELS PER LINE =4091  LINES PER BAND =3601 /3601
START LINE # =      BLOCKING FACTOR =   REC SIZE  =14731691  PIXEL SIZE =60.00
OUTPUT BITS PER PIXEL =8  ACQUIRED BITS PER PIXEL =8
BANDS PRESENT =LH
FILENAME =L71176039_03920010319_B61.FSTFILENAME =L72176039_03920010319_B62.FST
FILENAME =                              FILENAME =
FILENAME =                              FILENAME =


REV         L7A
```

Radiometric record

```
BIASES AND GAINS IN ASCENDING BAND NUMBER ORDER
-0.067086617777667       0.067086617777667
3.162795324963847        0.037204722719868
```

Geometric record

```
GEOMETRIC DATA MAP PROJECTION =UTM  ELLIPSOID =WGS84              DATUM =WGS84
USGS PROJECTION PARAMETERS = 0.000000000000000        0.000000000000000
0.000000000000000        0.000000000000000        0.000000000000000
0.000000000000000        0.000000000000000        0.000000000000000
0.000000000000000        0.000000000000000        0.000000000000000
0.000000000000000        0.000000000000000        0.000000000000000
0.000000000000000        USGS MAP ZONE =36
UL = 0303913.2473E 311555.7520N 276600.000    3461400.000
UR = 0331352.1132E 311712.1444N 522000.000    3461400.000
LR = 0331335.8053E 292015.0006N 522000.000    3245400.000
LL = 0304158.6095E 291904.3184N 276600.000    3245400.000
CENTER = 0315423.6518E 301823.1230N 394863.531    3353246.500   2046  1801
OFFSET =122    ORIENTATION ANGLE =0.00
SUN ELEVATION ANGLE =50.2 SUN AZIMUTH ANGLE =135.8
```

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B.3 L71176039_03920010319_HPN.FST – PANCHROMATIC

Administrative record

```
REQ ID =0750107040003_00001  LOC =176/0390000       ACQUISITION DATE =20010319
SATELLITE =LANDSAT7   SENSOR =ETM+       SENSOR MODE =NORMAL LOOK ANGLE =0.00
                        LOCATION =                  ACQUISITION DATE =
SATELLITE =           SENSOR =           SENSOR MODE =       LOOK ANGLE =
                        LOCATION =                  ACQUISITION DATE =
SATELLITE =           SENSOR =           SENSOR MODE =       LOOK ANGLE =
                        LOCATION =                  ACQUISITION DATE =
SATELLITE =           SENSOR =           SENSOR MODE =       LOOK ANGLE =
PRODUCT TYPE =MAP ORIENTED       PRODUCT SIZE =FULL SCENE
TYPE OF PROCESSING =SYSTEMATIC  RESAMPLING =NN
VOLUME #/# IN SET =01/01 PIXELS PER LINE =16361 LINES PER BAND =14401/14401
START LINE # =      BLOCKING FACTOR =   REC SIZE  =235614761 PIXEL SIZE =15.00
OUTPUT BITS PER PIXEL =8  ACQUIRED BITS PER PIXEL =8
BANDS PRESENT =8
FILENAME =L72176039_03920010319_B80.FSTFILENAME =
FILENAME =                              FILENAME =
FILENAME =                              FILENAME =


REV         L7A
```

Radiometric record

```
BIASES AND GAINS IN ASCENDING BAND NUMBER ORDER
-5.675590383724904       0.975590574459767
```

Geometric record

```
GEOMETRIC DATA MAP PROJECTION =UTM  ELLIPSOID =WGS84              DATUM =WGS84
USGS PROJECTION PARAMETERS = 0.000000000000000        0.000000000000000
0.000000000000000        0.000000000000000        0.000000000000000
0.000000000000000        0.000000000000000        0.000000000000000
0.000000000000000        0.000000000000000        0.000000000000000
0.000000000000000        0.000000000000000        0.000000000000000
0.000000000000000        USGS MAP ZONE =36
UL = 0303913.2473E 311555.7520N 276600.000    3461400.000
UR = 0331352.1132E 311712.1444N 522000.000    3461400.000
LR = 0331335.8053E 292015.0006N 522000.000    3245400.000
LL = 0304158.6095E 291904.3184N 276600.000    3245400.000
CENTER = 0315423.6518E 301823.1230N 394863.531    3353246.500   8181  7201
OFFSET =122    ORIENTATION ANGLE =0.00
SUN ELEVATION ANGLE =50.2 SUN AZIMUTH ANGLE =135.8
```

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APPENDIX C - ASSESSMENT OF USGS ENGINEERS

The e-mail here below has been forwarded by ESA project manager Philippe GORYL on 10/29/2001.

```
Bonjour,

> It is an excellent report.
Je suis d'accord.

Philippe
----- Forwarded by Philippe Goryl/esrin/ESA on 2001/11/05 10:30 -----
|--------+-------------------------------------------------------------->
|        |          "Jon B Christopherson"                               |
|        |          <jonchris@usgs.gov>                                  |
|        |          2001/11/02 18:28                                     |
|        |                                                               |
|        |  To:     Philippe Goryl/esrin/ESA@ESA                         |
|        |  cc:     Vincenzo Beruti/esrin/ESA@ESA,                       |
|        |          "David J Strande"   <strande@usgs.gov>               |
|        |                                                               |
|        |  Subject:  Re: USGS-ESA report                                |
|--------+-------------------------------------------------------------->


Dear Philippe,

I received the report and am impressed with the thoroughness of it.
It is an excellent report. We are reviewing it now and we have some
small recommendations to suggest for improvements to the testing
methodology but the general methods of the test and the format of the
report are superb.

Thank you,
Jon
-----------------------------------------------------------------------
Jon B. Christopherson
Sr. Systems Engineer, Landsat 7 Program
Raytheon ITSS/USGS EROS Data Center
Sioux Falls, SD  57198
(605)594-2563



Philippe.Goryl@esa.int
To:     "Jon B Christopherson" <jonchris@usgs.gov>
cc:     Vincenzo.Beruti@esa.int
10/31/2001  04:58
Subject:     Re: USGS-ESA report
```

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```
Philippe Goryl@ESA
10/31/2001 11:58 AM

Hello Jon,

The pdf file was put on : L7stacker.cr.usgs.gov
The file name is : Copy of gael-p041-rpt-002-00-03.pdf

If you have any comments or remarks, they are very welcome.

Best regards,

Philippe



|--------+------------------------------------------------------------>
|        |          "Jon B Christopherson"                             |
|        |          <jonchris@usgs.gov>                                |
|        |          2001/10/30 21:00                                   |
|        |                                                             |
|        |  To:     Philippe Goryl/esrin/ESA@ESA                       |
|        |  cc:     Vincenzo Beruti/esrin/ESA@ESA,                     |
|        |          "David J Strande"   <strande@usgs.gov>             |
|        |                                                             |
|        |  Subject:  Re: USGS-ESA report                              |
|--------+------------------------------------------------------------>


Hello Philippe,

One of our network people created an anonymous FTP site to receive
your report. The information is:

Location: L7stacker.cr.usgs.gov
Directory:     /pub

Put the files here. The file will not be visible once it is in the
directory, that is normal. Can you please send me a message when you
have done this so that I can get the files?  I look forward to seeing
this report!

Thank you,
Jon
-----------------------------------------------------------------------
Jon B. Christopherson
Sr. Systems Engineer, Landsat 7 Program
Raytheon ITSS/USGS EROS Data Center
Sioux Falls, SD  57198
(605)594-2563
```

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Philippe.Gory@esa.int
To: jonchris@usgs.gov
cc: Christophe.Demange@gael.fr
10/29/2001 10:39
Subject: USGS-ESA report

Hello,

Gael Consultant, in France, produced a report analyzing the USGS and ESA Landsat product difference.
Vinzo Beruti gave me your adress to send the report. The report size is actually too big to be sent by mail.
Could you please give me a ftp adress where I can put it ?

Best Regards,

Philippe

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